University of Zurich[UZH]

**Department of Informatics**

# Designing for Empowerment in Citizen Advisory Services

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The Faculty of Economics, Business Administration and Information Technology of the University of Zurich hereby authorizes the printing of this dissertation, without indicating an opinion of the views expressed in the work.

Zurich, July 15, 2015

Chairwoman of the Doctoral Board: Prof. Dr. Elaine M. Huang

*To my family*

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# ABSTRACT

Today's government front offices mainly provide transaction-oriented processing services. However, in recent years citizens' expectations have raised and are demanding more citizen-centric and individually tailored services including advisory services. Yet, front office employees, with having barely any additional training, have difficulty meeting these expanded expectations. In consequence, they frequently lack subject matter expertise as well as the necessary skills to meet the service demands. In addition, the organizational work environment, lacking necessary supportive resources, contributes strongly to the identified qualification deficiencies.

This dissertation addresses the shortcomings of previous approaches from research and practice for qualifying advisory service personnel. In response, a novel approach for IS-based on-the-job qualification is introduced in order to answer the main research question, *how government front office employees can be empowered to provide superior advisory service with the help of IS artifacts*. In four consecutive research essays, the dissertation provides comprehensive answer to the main research question. It introduces the concept of an *advisory information artifact* that, when deployed in front office employees' work environment, can effectively promote experiential learning on-the-job and ultimately empower service personnel comprehensively to act as skilled

advisors. While essay I reviews previous design-oriented IS research and stresses current research approaches' shortcomings, essay II and III introduces two essential components of an *advisory information artifact*, making it an effective on-the-job qualification measure: *counseling affordances* and *service encounter thinkLets*. Our research shows that providing counseling affordances can effectively promote experiential learning on-the-job and ultimately support front office employees in providing superior advisory service. Furthermore service encounter thinkLets revealed most effective to complement counseling affordances' on-the-job support and together provide service personnel with a scaffold that enables less-trained front office employees almost immediately to act as skilled advisors and to make the advisory service an individualized co-creation experiences. Finally, our research in essay IV revealed that deploying an *advisory information artifact* in citizen advisory service encounters allowed, first, for comprehensively empower public employees to act as skilled advisor. Second, our research showed how IS artifacts could be designed and deployed to effectively promote transformational changes in governmental service provision, bringing front offices from providing transaction-oriented processing services to offer true citizen-centric advisory services.

# ZUSAMMENFASSUNG

Heutige öffentliche Verwaltungen bieten in ihren Bürgerbüros Bürgern hauptsächlich transaktions-orientierte Services. In den letzten Jahren jedoch sind die Erwartungen der Bürger kontinuierlich gestiegen. Sie fordern vermehrt bürger-zentrierte und individuell auf sie zugeschnittene Dienstleistungen, im speziellen Beratungsservices, wie sie es von kommerziellen Dienstleistern gewohnt sind. Die Mitarbeiter in den Bürgerbüros haben jedoch Mühe diesen gestiegenen Anforderungen gerecht zu werden, da sie die entsprechende zusätzliche Ausbildung kaum erhalten. In der Folge fehlen Ihnen oftmals das notwendige breite Fachwissen und die methodischen Fertigkeiten um die neuen Anforderungen zu erfüllen. Diese Qualifikationsmängel verstärken sich noch zusätzlich im organisationalen Arbeitsumfeld der Bürgerbüros, in welchem die notwendigen Ressourcen zur Unterstützung der Mitarbeiter oftmals fehlen.

Um die Mängel bisheriger Ansätzen aus Forschung und Praxis zu überwinden, wird in dieser Dissertation ein neuartiger Ansatz für IS-basierte on-the-job Qualifikation vorgestellt. Innerhalb von vier Essays beantworten wir die Haupt-Forschungsfrage *wie Mitarbeiter in Bürgerbüros öffentlicher Verwaltungen mit Hilfe von IS-Artefakten befähigt werden können einen besseren Beratungsservice anbieten zu können*. In vier Forschungs-Aufsätzen liefert diese

Dissertation eine ausführliche Antwort auf die Haupt-Forschungsfrage. Es wird das Konzept eines *advisory information artifact* vorgestellt, mit welchem auf effektive Weise experiential learning on-the-job initiiert werden kann und mit welchem Mitarbeiter umfassend unterstützt werden können als qualifizierte Berater aufzutreten.

Essay I gibt ein Überblick über die bisherige design-orientierte IS-Forschung und zeigt die Mängel bisheriger Ansätze auf. Essay II und III führen zwei der essenziellsten Bestandteile eines *advisory information artifacts* ein, welche es zu einer effektiven on-the-job Qualifkationsmassnahme machen: *counseling affordances* und *service encounter thinkLets*. In unserer Forschung konnten wir zeigen, dass die Bereitstellung von *counseling affordances* auf effektive Weise experiential learning on-the-job initiieren kann und dabei die Mitarbeiter fortlaufend dabei unterstützt einen besseren Beratungsservice anzubieten. Die *service encounter thinkLets* zeigten sich als äusserst effektives Mittel um in Ergänzung der counseling affordances dem Servicepersonal ein Gerüst bereitzustellen. Mit diesem können kaum trainierte Bürgerbüro-Mitarbeiter fast umgehend dazu befähigt werden als qualifizierte Berater aufzutreten und das Beratungsgespräch in eine individualisierte co-creation experience zu verwandeln. Schliesslich, zeigt Essay IV auf, dass der Einsatz eines *advisory information artifact* in Bürgerberatungsservice die Mitarbeiter der öffentlichen Verwaltung umfassend zu befähigen vermag um als qualifizierte Berater aufzutreten. Zum zweiten zeigt unsere Forschung wie IS Artefakte gestaltet und eingesetzt werden können, um transformative Veränderungen in der Servicebereitstellung öffentlicher Verwaltungen effektiv zu unterstützen und voranzutreiben. So kann der Einsatz eines *advisory information artifact* Bürgerbüros dazu befähigen ihre Serviceangebot von transaktions-orientieren Sachbearbeitungen auszuweiten und zukünftig bürger-orientierten, wahren Beratungsservice anzubieten.

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# PART I – SYNOPSIS

# 1 SYNOPSIS

## 1.1 Introduction

So far, government front offices have mainly provided transaction-oriented processing services to citizens. However, in recent years citizens' expectations have raised and are demanding more citizen-centric and individually tailored services, including advisory services. Yet, front office employees, since they were mostly transferred from back offices to front offices without barely any additional training, have difficulties meeting these expanded expectations. They frequently lack subject matter expertise as well as necessary skills to meet the increasing service demands. Thereby, the organizational work environment, lacking the necessary resources (e.g., time for off-the-job training or money for teaching staff), contributes strongly to the identified qualification deficiencies. With constantly expanding service offers, changing service goals, and introduction of new IT-systems, continuous qualification of service personnel is essential.

Addressing the shortcomings of previous approaches from research as well as practice for qualifying advisory service personnel in government front offices, the dissertation introduces a novel approach for IS-based on-the-job qualification and shows its feasibility and effectiveness. Focusing on advisory encounters in local government front offices, the dissertation answers the main research question: *How can front office employees be empowered to provide superior advisory service with the help of IS artifacts?* In the course of the dissertation's research, the notions of "empowerment" and qualification" are used for describing the same concept from two perspectives, first from the front office employees' inner view (of being empowered to…) and second from the organization's outside view (of qualifying service personnel to…).

The dissertation investigates the main research question along four research essays. They report from consecutive research studies that answers refined research questions. The individual research essays' findings contribute to the

development and assessment of the construct of an *advisory information artifact*, which when deployed in front office work environment can effectively promote on-the-job learning and ultimately empower service personnel to become and act as skilled advisors. An overview of the individual research essays is provided in section 1.5. Also, essays II, III and IV represent research articles currently under review at peer-reviewed journals.

## 1.2 The dissertation's methodological approach

The dissertation's research follows a design science research paradigm (Hevner et al., 2004). The design science approach is well suited to solve such "wicked" design problems, characterized by changing requirements, an ill-defined environment, and a dependence upon human cognitive abilities (ibid.). Thereby, technological artifacts are created using scientific knowledge to solve an important practical problem (Briggs and Schwabe, 2011). For engaging in actual research activities, the general design science research paradigm was refined by specific research methodology selected for each essay to reach the respective research objectives. Essay I follows Hevner's (2007) relevance, design and rigor view on design science, essay II follows Peffers et al.'s (2007) six activities for conducting design science research, and essays III and IV each follow Sein et al.'s (2011) four activities for conducting action design research. In doing so, different theories, models, and concept from psychological, HCI-, or CSCW- research are used to inform design of research artifacts and measurements of its effectiveness in experimental evaluations in actual organizational environments. Figure 1.2-1 depicts an overview of the research approaches applied in the individual research essays.

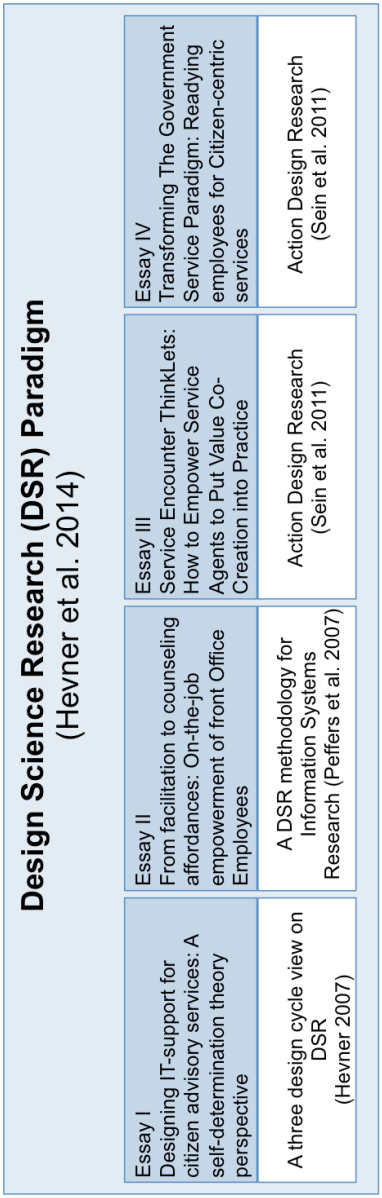


**Figure 1.2-1: Overview of the dissertation's research approach**

## 1.3 The dissertation's main findings

As result of a thorough review of previous design-oriented IS research, essay I describes a set of generic design requirements for advisory support information systems, which integrates the design knowledge from previous research approaches. Essay I thereby stresses the shortcoming of current research approaches of merely focusing on skilled advisors. In consequence, their supportive IS-solutions are frequently rather complex and thus ill-suited for supporting front office employees in government, who hardly received any advisory-related training.

For addressing current research gaps, the dissertation introduces the construct of *advisory information artifacts* (described in essay II-IV). Thereby, an advisory information artifact consist of the two main components *counseling affordances* and *service encounter thinkLets*:

The *counseling affordances* are described in form of generic design principles that should be considered when designing and implementing advisory support information systems (described in essay II). In our research, counseling affordances revealed to be suitable means to bring front office employees to try out new advice-giving work practices, ultimately leading to improved advisory services. Essay II points to the beneficial relationship between counseling affordances and on-the-job learning, where counseling affordances provide learners (i.e., front office employees) with continuous methodical guidance to acquire the necessary advisory-related skills.

The *service encounter thinkLets* are described as social behavior guidelines that support front office employees to invoke fruitful IS-supported collaboration with clients in their advisory service encounters (described in essay III). In our research, they revealed most effective to complement counseling affordances' on-the-job support and together provide service personnel with a scaffold that enables front office employees almost immediately to act as skilled advisor and to make the advisory service an individualized co-creation experiences.

With focus on the organizational context of local government front offices, our research in essay IV revealed that deploying an *advisory information artifact* in citizen advisory service encounters allowed, first, for comprehensively empower public employees to act as skilled advisor. Second, our research showed how IS artifacts could be designed and deployed to effectively promote transformational changes in governmental service provision, bringing front offices from providing transaction-oriented processing services to offer citizen-centric true advisory services.

## 1.4 The dissertation's contributions to research and practices

With developing and evaluating the construct of advisory information artifacts, the dissertation showed how IS artifacts can be made feasible and effective means to empower public service personnel on-the-job to become and act as skilled advisors. In doing so, the thesis offers several contributions.

With developing and assessing counseling affordances and service encounter thinkLets, this dissertation provides novel insights to existing research on advisory support and extends the design knowledge on advisory support information systems. These insights contribute to the domain of information systems (by developing and assessing new IT-based solution to established problems) and to the domain of service science and service systems (by introducing effective measures for establishing co-creative service experiences).

The dissertation, furthermore, contributes to current e-government research, first, by deepening the insights on the influential role of IS artifacts to promote government reforms and transformational changes. Second, it provides effective, IT-enabled measures for counteracting the prevailing qualification issues in public administrations' front offices.

With highlighting the beneficial relationship between counseling affordances and on-the-job learning, the dissertation help deepening the understanding

of educational affordances in e-learning research and the suitable adoption of ICT to promote learning in the workplace.

As contribution to HCI and CSCW research, the dissertation provides, first, applicable design principles for equipping IS artifacts with counseling affordances and, second, the conceptual design of service encounter thinkLets. Therewith, researchers and developers with HCI- or CSCW-background can benefit and use these research products to deepen their understanding of dyadic (advisory) collaborations and improve information system design.

Finally, practitioners in public administrations can benefit from our findings and improve previous qualification strategies of their service personnel with our concept of counseling affordances and service encounter thinkLets and add effective measures for ongoing on-the-job learning to qualify their front office employees, thereby improving customer service quality.

## 1.5 Overview of Research Essays

The dissertation seeks to answer the main research question and produce the individual contributions in four consecutive research essays (section 2 to 5). In this section, we provide a summary of the individual research essays including their associations to previous and current publications.

### *1.5.1 Essay I: Designing IT-support for citizen advisory services: A self-determination theory perspective*

The first essay reviews and assesses the current literature on design-oriented IS research for advisory support from the perspective of the self-determination theory. The self-determination theory (cf. Deci and Ryan, 2000) builds the foundation for the dissertation's approach to empower public front office employees on-the-job to become and act as skilled advisors. It describes an individual's constant urge to fulfill his/her innate need for competence, autonomy, and relatedness. With analyzing the current research literature, the essay answers its first research question of

w*hat are the generic design requirements for advisory support information systems supporting advisors and clients in fulfilling their basic needs for competence, autonomy, and relatedness*. The resulting literature-based design requirements are refined by conducting two design-and-evaluate cycles, where the design requirements are implemented in a software prototype and evaluated in test advisory sessions in the context of advisory service for "New-in-town"-students. Thereby, the essay addresses the second research question *how the organizational characteristics in public administrations' front offices do influence the design of suitable advisory support*. Concluding, the essay emphasizes previous research approaches' shortcomings of merely supporting skilled advisors and stresses the notion of treating government front office employees as learners, providing them with suitable methodical guidance to acquire the necessary advisory-related skills.

### *1.5.2 Essay II: From facilitation to counseling affordances: On-the-job empowerment of front Office Employees*

The second essay is concerned with developing and evaluating the first main construct for effective empowering governmental front office employees on-the-job to become and act as skilled advisors. It introduces the construct of *counseling affordances* and shows how IS artifacts can be designed and deployed in advisory service encounters to effectively bring front office employees to show improved advice-giving behavior. In doing so, the essay tests the working hypothesis that *appropriately designed affordances will move advisors to try novel advice-giving work practices during service encounters.* In two design-and-evaluate cycles, six design principles are developed, which describe how IS artifacts can be equipped with counseling affordances. Evaluations with 18 front office employees from the local government of Mannheim and 48 "New-in-town"-citizens were conducted. Findings indicate that "learning with counseling affordances" promises to be an effective approach to initiate experiential learning on-the-job and thus to help front office employees to learn about and provide superior advisory services. The essay highlights counseling affordances' usefulness and effectiveness in providing guidance to front office employees as learners in

learning novel advice-giving behaviors. The six design principles provide practitioners with useful guidelines to implement the "learning with counseling affordance" approach in their organizations. In the resource-constrained organizational environment of public administrations' front offices, it provides managers with a suitable alternative to previous learning-from-others approaches, to instruct and support their employees in extending their knowledge and skills where it matters: within actual customer service encounters.

Essay II builds on previous publication, specifically Giesbrecht et al. 2014, and includes its findings on the first design-and-evaluate cycle. Furthermore, it includes insights from Giesbrecht et al. 2011. The essay is currently under review at the Journal on Transforming Government: People, Process and Policy (Giesbrecht et al., 2015a).

### *1.5.3 Essay III: Service Encounter ThinkLets: How to empower service agents to put value co-creation into practice*

The third essay is concerned with complementing the IS-based advisory support approach. Thereto, the essay stresses the importance of establishing co-creative interactions in face-to-face advisory service encounters and highlights not only today's front office employees' deficiencies, but discloses why the technical support from counseling affordances (cf. essay II) do not suffice to empower them comprehensively. Thereto, the third essay answers the research question *how service agents can be empowered to establish co-creative interactions in their IT-supported service encounters with clients*. It introduces the construct of a service encounter thinkLet (SET), which build on the concept of thinkLets known from collaboration engineering. An SET provides front office employees with social interaction guidelines to invoke fruitful IS-supported collaboration in advisory service encounters. The essay shows how service encounter thinkLets can complement existing advisory support measures and together create a socio-technical framework to enable front office employees to transform the advisory service encounter into a collaborative work environment, bringing themselves, clients and supporting information systems together to create the advisory's value in a

co-creation experience. Insights from evaluations with twelve front office employees from the local government front office of Mannheim and 36 "New in town"-citizens gave first evidence that service encounter thinkLets can effectively empower front office service personnel on-the-job to adapt their work practices and bring value co-creation into practice.

The research presented in essay III partly builds on previous publications. The findings on current state of IT-supported citizens' advisory service and the occurring deficiencies have been published in Giesbrecht et al. 2014 and Giesbrecht et al. 2011. The essay is currently under review in a second round at the Information Systems Journal (Giesbrecht and Schwabe, 2015).

### *1.5.4 Essay IV: Transforming the government service paradigm: Readying employees for citizen-centric services*

Essay IV discusses our research in the larger organizational context of public administrations and highlights its effect and impact on government research. For motivation, the essay stresses the necessity of changing current service provision in government front offices, characterized by transaction-oriented processing, to offering true citizen-centric advisory services. While concepts, influencing factors, or impediments that enable transformational change were extensively discussed for back offices in e-Government research, the physical front offices with their service-providing employees have been frequently omitted from such study. Given the severe time-, cost-, and personnel-related constraints, the change of structures and practices in government front offices presents a serious challenge; however, it nonetheless appears fundamental to governments' modernization. The essay addresses this issue and answers the two research questions *how front offices can be transformed to offer true advisory services* and more specifically *how front offices' employees can be empowered to offer true advisory service*. Thereto, it introduces the notion of an *advisory information artifact*, which brings together the advisory support concepts of counseling affordances (cf. essay II) and service encounter thinkLets (cf. essay III). Insights from evaluations with twelve front office employees from the local government of Mannheim and 36 "New in town"-citizens provided first evidence of the large potential of

*advisory information artifacts* to promote transformational change in government front offices. Thereby, introducing an advisory information artifact into front office work environment could effectively support changing public front-office employees from bureaucratic administrators to skilled advisors and ultimately offer true citizen-centric advisory services.

Essay IV builds on essay II and III, specifically in the solution description. The essay is currently under review at the Government Information Quarterly Journal (Giesbrecht et al., 2015b).

## 1.6 Limitations and future work

**Transferability**: The larger part of the research studies were conducted in collaboration with an individual local government in Germany (with the city of Mannheim). However, e-government research literature indicates that the essential characteristics of work environments in governmental front offices are quite similar in different cities and even different countries. Thus, we argue that our findings can be transerred to citizen advisory encounters in other local governments' front offices. Furthermore the construct of an advisory information artifact with its individual components builds on the general concept of affordances (Gibson, 1977; Stoffregen, 2003) and of thinkLets (Briggs et al., 2003, 2001), and is fitted to a generic problem-solving process (Simon et al., 1987). Accordingly, our findings might be transferable also to advisory service encounters in private domains, like, e.g., advisory services in travel agencies or financial advisory services. But we advice that further research first assess the organizational preconditions and refine the operational design and instantiation of an advisory information artifact correspondingly before applying our insights and deploying corresponding advisory support.

**Participants in the research studies**: We benefited from testing our research products with actual front office employees (from the university of Zurich (essay I) or from the public administration of Mannheim (essay II-IV)), as we could improve the external validity of our evaluations. Regarding

participating clients (i.e. citizens), we mostly used convenience sampling, which lead to a larger part of the participants being university students. Hence, while these participants could not represent all citizen groups equally well, specifically elderly and families with older children, they do represent usual clients of public administrations with their civic rights and duties. In all other demographic or social aspects, all participating citizens represented usual clients of government front offices. In this context, the results of the individual evaluations did not indicate any effects of any demographic variable on the test clients' assessments.

**Organizational integration**: While working in a real-world context with actual front office employees allowed us deep insights, evaluations with actual front office employees could only be done in shorter-period test setting (ranging from one day to six days). Hence, we could not conclude on the actual organizational integration and the long-term appropriation of our solution approach. Therefore, we suggest that future research should conduct longer-period user test, like e.g., with a pilot system, to complement our research with corresponding insights.

**Limitations of the approach**: While we found that with our solution approach, front office employees were perceived as more competent and capable to provide sound advisory service, we could only assess participants' subjective perceptions and observe their respective behaviors. Thus, we could not conclude whether employees' advisory-related skills were objectively improved. We suggest that future research activities could investigate the effects of the perceived empowerment of front office employees and their objective gain on advisory-related skills.

In our research, we could show that our solution approach can (significantly) improve the chosen benchmark situation, i.e., traditional advisory service encounters, supporting front office employees effectively to provide superior advisory service. However, as "the search for the best, or optimal, design is often intractable for realistic information systems problems" (Hevner et al., 2004, p. 88), we do not claim that our solution approach represents the best possible approach. Interesting future research

activities would comprise comparing our solution approach with other concept for promoting on-the-job learning and especially investigating the role of information technology, used to deploy these measures in employees' workspaces.

Finally, we introduced IS-based support measures that are effective with less trained service personnel and therewith address previous solution approaches' shortcoming of merely focusing on well-trained advisors. However, a dependency on front office employees' basic skills remains. Whereas the developed service encounter thinkLets provide behavioral guidelines seeking to ensuring beneficial use of the advisory information artifact, the concept of counseling affordances requires that front office employees to possess the capability to perceive affordances (as perceiving affordances is not naturally given, but must be learned (Guski, 1996)). Future research should clarify these preconditions and determine its effects, first, on the design of advisory information artifacts and, second, on the organizational integration of our solution approach.

# PART II – RESEARCH ESSAYS

# 2 DESIGNING IT-SUPPORT FOR CITIZEN ADVISORY SERVICES: A SELF-DETERMINATION THEORY PERSPECTIVE

Research essay I[1]

***Abstract***

*In public advisory services, the individual's satisfaction depends less on extrinsic factors (e.g., monetary rewards) than on their inner needs fulfillment. Currently used IT-systems supporting citizen advisory services neglect these intrinsic needs of their users, hence insufficiently fostering their satisfaction. In this article, we aim to close this gap by assessing the design requirements needed to develop value-added IT-systems supporting citizen advisory services. We argue that previous developments of design requirements for correspondent IT-systems neglect the users' motives and focus merely on their actions. We thus refer to self-determination theory as a theoretical lens to analyze current literature on how to design adequate IT-systems fostering users' basic needs. In doing so, we introduce design goals and demonstrate to what extent they are fulfilled when these design requirements are implemented in a real-world IT-system that supports citizen advisory services. We follow a design science approach, in which the previously elaborated requirements are implemented in a software prototype, and are then evaluated qualitatively in two user studies with real-world advisors and citizens to assess their suitability relative to the design goals. Our results show that this approach promises to reveal the design requirements that matter in citizen advisory services, signifying an important step toward developing a conceptual IT systems design theory.*

## 2.1 Motivation and Background

IT-enabled work practices are commonly used in public administration's front and back offices, and continue to flourish due to numerous e-

[1] First versions of this research essay were published at HICSS Conference (Giesbrecht et al., 2012) and in the eService-Journal (Giesbrecht et al., 2013).

government initiatives. Despite all self-service offers put forward by the different governments worldwide, the personal service encounter of citizens with front office employees representing their government is still of immense importance. In this context, appropriate IT-based support has to keep up with the changing needs of the citizens and with the continuous modernization of the public administration.

In this article, we focus on face-to-face advisory services, where citizens seek advice from public administration's employees to resolve their government-related issues when they enter a novel life circumstance e.g., expecting a child or moving into a new town. We refer to this face-to-face advisory encounter between a citizen and a public administration's employee as *citizen advisory service*. Citizens, which call upon these services, aspire to holistically enhance their current social situation. They seek advice as they often are aware of their lack of information, but cannot explicate the underlying problems (also referred to as *anomalous state of knowledge*, Belkin et al., 1982), which is a prerequisite for effective problem solving. Accordingly, front office employees need to behave as dedicated advisors and give sound advice to citizens then mere processing of transactions.

When investigating citizens' satisfaction with the IT-support of services, researchers in information system research often concentrate on the individual's system use. *Intention to use* and (actual) *system use* are taken as common measures to obtain indicators for a system's acceptance and, therefore, its real success (Legris et al. 2003). These concepts to measure the success of information systems are discussed in detail in the research literature (Delone, 2003; Parasuraman et al., 1988; Zeithaml et al., 1988), originating from service marketing research. They are mainly focusing on the pragmatic quality (Hassenzahl, 2010), which primarily targets the system's characteristics to promote the individual work performance, i.e., the perceived usefulness and the perceived ease of use (for an extensive overview see Carvalho et al., 2010).

Looking at the dyadic service encounter of citizen advisory services, common models for measuring user satisfaction are often inadequate. On the one hand, some of these models do not sufficiently consider both parties involved, but focus mainly on one, e.g., SERVQUAL (Parasuraman et al., 1988) with its focus on customer satisfaction. On the other hand, corresponding models do not incorporate users' inner motivation, e.g., UTAUT (Venkatesh et al., 2003). In this context, even though this is not always made explicitly, many approaches in Human-Computer Interaction (HCI) research investigating *intention to use* are goal-oriented, focusing on extrinsic motivation of human behavior, e.g., reward-driven action. Thereby, they merely focus on the "what" or the "how" regarding the users' actions, but neglect the "why". In HCI research, three levels of goals can be discerned: (1.) be-goals (why), (2.) do-goals (what) and (3.) motor goals (how) (see Figure 2.1-1). All these goals are grounded in theories of action, e.g., self-regulation theory (e.g., Carver and Scheier, 2001) or activity theory (e.g., Kaptelinin and Nardi, 2009). Do-goals represent the concrete outcome one wants to attain, "Making a telephone call", for instance. Motor goals, representing the sub-structure of do-goals, are considered to work below the do-goals. For example, "Making a telephone call" can be decomposed into sub-goals, e.g., "Type in numbers" or "Press *dial*". On top of these two levels of goals are the be-goals, like "Being competent" (to operate a telephone) or "Feeling related to others" (and thus using the telephone) for instance. Be-goals give meaning to actions. By knowing users' be-goals, we can determine why they perform actions the way they do. Researchers in HCI often neglect these motives and underlying needs of the users. Hassenzahl pointed out in his book on experience design that "HCI primarily focuses on models, methods, and theories of do-goal achievement" (Hassenzahl, 2010, p. 13).

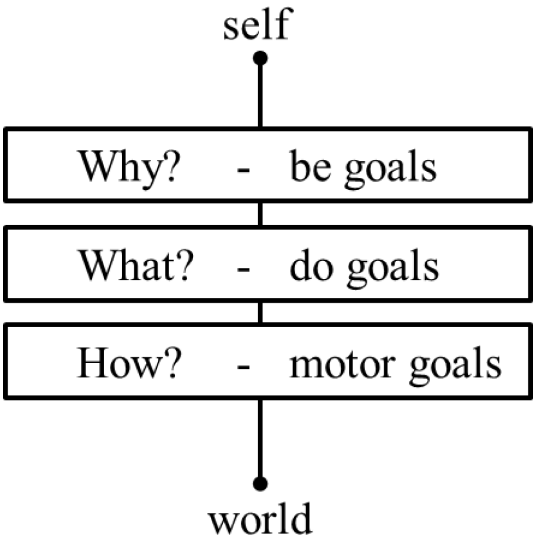


**Figure 2.1-1: A three level hierarchy of goals (Hassenzahl, 2010)**

The motives and underlying needs of individual users and their be-goals, particularly gain importance when creating suitable support for advisors and clients in their face-to-face service encounters in the organizational context of public administration because it differs from most other organizational contexts significantly. A number of studies comparing work motivation in the public and the private sector pointed out that public employees are less motivated by monetary or other extrinsic rewards than their private counterparts (see Anderfuhren-Biget et al., 2010; Buelens and Van den Broeck, 2007; Grant, 2008; Rainey, 1982). Additionally, public employees on different organizational levels do not seem to be convinced of corresponding incentives and the rewarding effects of extrinsic motivators, such as performance-related pay (Marsden et al., 2001). And ultimately, Rainey (1982) stated, that the additional problem arises of "how to motivate employees in systems which constrain administration of those incentives." We argue that one has to take a more holistic perspective on user motivation

and, and ultimately, user behavior to understand the rationales behind user satisfaction of IT-systems supporting employees in public administrations' front offices providing superior advisory service to their citizens. In doing so, we consider the users' underlying needs that motivate their activities. This approach fits well into the motivational perspective, which Malone (1985) states as one of four important perspectives, one should take on when designing information systems' interfaces.

The current research literature on the development of IT-systems supporting advisory encounters in general, and advisor-citizen interactions in particular, proposes a number of design requirements, which have proven to be successful. To assess these current design requirements, we provide in this article a review of scientific findings on how IT-based citizen advisory services can support fulfilling the actors' basic needs in their advisory encounters and thus ultimately improve their service satisfaction. We use self-determination theory (SDT) (see Deci and Ryan, 2000) as a lens to explain the basic needs of the involved individuals. Deci and Ryan, the authors of this theory, postulate that humans are driven by the motivation to lead a self-determined life, and claim that there are three innate psychological needs that humans are constantly aspiring to fulfill: *competence*, *autonomy*, and *relatedness*. Every human action is intrinsically motivated by the expectation that the result or the action itself will fulfill certain basic human needs in a particular context. Accordingly, if these needs are fulfilled – at least to a certain extent – this will result in increased satisfaction (Erpenbeck and von Rosenstiel, 2007). Thus in the first research question, we want to answer *what are the generic design requirements for advisory support information systems supporting advisors and clients in fulfilling their basic needs for competence, autonomy, and relatedness* (RQ1). Corresponding principles of implementation are a typical result from design-oriented research (Hevner et al., 2004). Ultimately, they can be abstracted and generalized to design principles that are less tied to a specific problem but to a certain class of problems, helping to deepen our understanding of advisory support information system's design and its

effect on its users. Formulating design requirements, as performed in this article, represent one step towards the development of design principles.

Citizen advisory services in public administrations' front offices distinguish themselves from other advisory contexts: One the one side, introducing suitable support measures can be hampered by front office employees' *public service motivation* (Anderfuhren-Biget et al., 2010), describing their strong intrinsic motivation and existing aversion to extrinsic incentives trying to influence them. On the other side, organizational support is often limited, like inappropriate, non-personalized auxiliary means (Lenk and Klee-Kruse, 2000; Schenk and Schwabe, 2011) or lacking resources for advisory-related training (teaching staff or time for off-the-job training) (Lenk and Schuppan, 2011). Therefore, based on the insights from our literature review and the deduced set of generic design requirements (cf. Table 2.2-1), we want to answer in a second research question, *how do the organizational characteristics in public administrations' front offices influence the design of suitable advisory support?* (RQ2)

By answering these two research questions, we want, on the one hand, broaden our understanding of advisory information system design, and on the other hand, provide future developers with a useful catalogue of design requirements that should lead to substantially more satisfied users if these design requirements are implemented. By following the theory for self-determination (Deci and Ryan, 2000) , we heed the call for "kernel theories" for design (see Walls et al., 1992). As we will show, self-determination theory is well suited to serve as such a kernel theory for designing advisory support systems. Secondly, we want to contribute to the ongoing research discussion on information system research for electronic services, by drawing the attention on the systems' users with their motivational background and their basic needs, which should be satisfied.

In the following section, we provide a review of the current literature on IT-based advisory support information services from the perspective of self-determination theory. In doing so, we, first, derive design goals for

appropriate IT-support for face-to-face advisory service encounters. Second, according to the individual design goals, we provide an overview design requirements from the existing research literature. In section 2.3, we describe our research design, where we followed a design science research approach and explain the methodology for collecting the data. In section 2.4, following the design science research framework from Hevner et al. (2004), we report from the research's *relevance cycle*, that is, highlighting the problems and deficiencies in today's citizen advisory services in the context of use that we have chosen, namely student counseling service. In section 2.5, we enter the *design cycle* and describe the first from two design phases of the study: We describe the design solutions for an IT-system supporting face-to-face student advisory services which we developed according to the elaborated literature-based design requirements (see section 2.2). In section 2.6, we report from the evaluation of the developed design solutions and the following revision and reevaluation. We conclude the article with our reflections on our findings and highlighting the contributions made to the scientific community, i.e. *rigor cycle*.

## 2.2 A Self-Determination Perspective on IT-supported Citizen Advisory Services

The self-determination theory proposed by Deci and Ryan (2000) is rooted in motivational psychology, and provides an empirically founded theoretical framework to describe the basic psychological needs and their influence on human behavior. It claims three innate psychological needs (competence, autonomy, and relatedness) that all humans pursue at any given time to maintain their psychological health and well-being. Accordingly, we will consider all these aspects from the perspective of the citizens and the advisors. Three design goals will be formulated which should be considered when designing IT-systems supporting self-determined users in their advisory interaction. When referring to the elaborated design goals later we denote them with "*DG1*" to "*DG3*".

***Competence*** refers to the aspect of successfully dealing with one's environment. In general, this concerns having sufficient information and skills to resolve any occurring issue on one's own. In the context of an advisory service, citizens and advisors both want to be competent during their encounter, by, e.g., influencing the course of their collaboration. Whereas for citizens, this could comprise arriving at a state of acquiring sufficient knowledge about their problems and how to resolve them, advisors predominantly have the more complex need for having sufficient professional, methodical, and social skills to provide sound advice (Erpenbeck and von Rosenstiel, 2007). Accordingly, the first design goal for appropriate IT-support in advisory service encounter should be to *increase the user's competence (DG1)*.

***Autonomy*** refers to freedom of choice and being able to lead a self-determined life. This basic need corresponds well with the counselor's goal of enabling citizens to resolve any government-related problem occurring within their individual life situation (Warschburger, 2009). The concept of autonomy further refers to the constant urge to be the cause of one's own actions, in contrast to the feeling that extrinsic forces cause them. For this reason, the provision of choice and acknowledging people's inner experience enhances their feeling of self-initiation (Deci and Ryan, 2000). Concerning the design of appropriate IT-support, we want to refer to this in a second design goal as *increasing the users' autonomy (DG2)*.

***Relatedness*** refers to the possibility of interacting with others. During the advisory session, this need for interaction has to be satisfied. Reis et al. (2000) identify the major types of social activity that might plausibly contribute to a general sense of relatedness. Regarding advisory encounters, the following can be considered relevant: (1) communicating about personally relevant matters, (2) participating in shared activities and (3) feeling understood and appreciated. If IT-systems are applied in advisory situations, they should support these activities in some way in order that *the users' relatedness is fostered* (*DG3*).

By applying the self-determination theory, we intend to take a wider perspective and seek to complement the understanding of advisors' and clients' behavior during an advisory session. Thus, in the subsequent paragraphs, we explain how information systems supporting citizen advisory services can foster advisors' and clients' corresponding SDT-related needs, i.e., their need for competence, autonomy, and relatedness. Therefore, we analyzed the current research literature on advisory support to assess to what extent the fulfillment of the users' need for competence, autonomy, and relatedness is addressed. When referring to the elaborated design requirements, later in this article, we denote them with "*DR1*" to "*DR9*".

### *2.2.1 Requirements for Increasing Competence*

Competence refers to successfully dealing with one's environment. According to the SDT, the involved individual within the dyadic advisor-client encounter strives for competence. The main reason for citizens to seek advice from public authorities is the gap in their knowledge of governmental services regarding their present life circumstances, e.g., when moving into a new town: "how to get a residence permit", "how does the waste system work" or "what financial aid can be received and how to apply". Apart from their basic need of improving their current situation, citizens are often not able to articulate what they really want (*anomalous state of knowledge*, Belkin et al. 1982). In these situations, human advice is superior to computer-based advice, e.g., electronic services on governmental Web appearances, since a human can empathize and help eliciting hidden, unaware needs in a question-answer dialog. In this context, front office employees, striving for satisfying their need for competence, want to comply with these advisory-related tasks. However, they rarely are sufficiently prepared owing to a lack of organizational support, i.e. a lack of resources for the necessary training or qualification (e.g. Lenk and Schuppan, 2011) or missing adequate auxiliary means (e.g. Lenk and Klee-Kruse, 2000; Schenk and Schwabe, 2011). Accordingly, Schmidt-Rauch et al. (2010) and Schwabe et al. (2010)

refer to this and state the requirement of *supporting the elicitation of the citizen's implicit needs* (*DR1*).

The collaborative nature of the advisory session is one of the most important characteristics due to the fact that, first, a common understanding of the client's problems has to be established and, second, information and knowledge of solutions has to be transferred from the expert (= advisor) to the layperson (= client). Schwabe et al. (2010) and Nussbaumer et al. (2012) describe that collaborative processes between advisor and client evolve continuously and, thus, cannot be structured beforehand in detail. They claim that in order to interact actively within the advisory encounter both, advisors and citizens must be able to understand the state of their collaboration at all times, like e.g., which results have been achieved (in relation to the advisory session's goal), what open issues need to be addressed, to what activity, etc. These researchers thus propose that *the state of collaboration must be transparent at all times* (*DR2*). This design requirement could also be referred to as *increase process transparency*, as Nussbaumer et al. (2012) call it.

By integrating the client into the problem-solving process, their perception of being responsible for the decisions agreed upon can be enhanced. According to Deci and Ryan (2000), this feeling of responsibility is essential for the heightening of their perceived competence. In line with Schmidt-Rauch et al. (2010), we refer to this as *supporting joint problem-solving* (*DR3*). Schmidt-Rauch et al. (2010) and Nussbaumer et al. (2012) connect this design requirement with the recognized trend within service-oriented marketing (Lusch and Vargo, 2006) that clients become co-creators of value (Prahalad and Ramaswamy, 2004a; von Luke, 2011; Whitaker, 1980). Within the first step of the joint problem-solving process, where a common understanding of the citizen's (true) needs is established, advisors and citizens individually create their own mental models, which have to be harmonized (Schwabe et al., 2010a). Accordingly, Schwabe et al. (2010a) formulate the requirement for suitable support to *enable advisors and citizens to externalize and share their mental models*, denoted as (*DR4*).

The need to feel competent to advise citizens on their governmental concerns (from the advisors' perspective) and being able to decide on the right "products" (from the citizens' perspective) directly calls for information quality as a pre-condition. This, for instance, is confirmed by DeLone and McLean, who nominate information quality as an aspect of IS success within their IS Success Model (Delone, 2003; Delone and McLean, 1992). In addition, the advisors' usage of IT is strongly influenced by their fear of acting incompetent, i.e., not being able to answer the client's questions due to inadequate access to information. Thus, an important design requirement is to *improve information quality* (*DR5*) (Schmidt-Rauch et al., 2010). For the organizational context of citizen advisory, Schenk and Schwabe (2010) describe similar design requirements in more detail. They complement the advisory service by *integrating offline and online information sources from different governmental levels (local, regional, state, federal)* (*DR5.1*) and *integrating internal and external information* (*DR5.2*).

### 2.2.2 *Requirements for Increasing Autonomy*

In the context of co-located citizen advisory services, a key influencing factor of the individual's autonomy appears in conflict between providing possibilities of choice and structuring of the advisory process. From a "counseling as collaboration" perspective (S. Schmidt-Rauch and Nussbaumer, 2011), there should be features for the users to create and evolve the process structure during their ongoing collaboration (Schwabe et al., 2010), even though some predetermined structure is necessary to support mutual understanding of the current (process) status and the upcoming activities. Corresponding support would also need to address the advisors' intrinsic work motivation (addressing their public service motivation; (Anderfuhren-Biget et al., 2010) and aversion of external incentives, and thus should refrain from purporting rigid process structure. In this context, Heinrich et al. (2014) also called for omitting "any visualization of a determined process" (Heinrich et al., 2014, p. 117). In the context as design

requirement for advisory support information systems, we refer to this as *support evolution of process structure during collaboration* (*DR6*).

One of the main objectives of an advisory session should be to enable clients to resolve their problems on their own (Warschburger, 2009). Therefore, an important first step is to personalize the information provided within the advisory encounter and to adapt it on the citizen's individual situation. Increased personalized information leads to a higher autonomy for citizens as a result of having increased options (Aschoff and Schwabe, 2011). We refer to this as *supporting the personalization of information* (*DR7*).

According to their individual roles within the ongoing collaborative problem-solving process, both advisors and citizens must have, to a variable extent, the capability to alter the direction of the advisory session (Nussbaumer and Matter, 2011). The advisor should guide citizens through the process, and thereby act as a mentor, eliciting their true needs and conjointly developing suitable solutions to fulfill these needs. We refer to this as *support flexible aggregation of information* (*DR7.1*). Although the advisor needs sufficient possibilities of control to navigate through the process, the clients – in order to feel as equal collaboration partners – must still be given the possibility of intervening in the advisory process, which in turn, will augment their feeling of self-determination.

### *2.2.3 Requirements for Increasing Relatedness*

*Relatedness* refers to interacting, feeling connected, and experiencing caring for others. Deci and Ryan (2000) claim that intrinsic motivation will be more likely to flourish in contexts characterized by a sense of secure relatedness. Within citizen advisory sessions, both participants must be supported in fulfilling their need for relatedness. In the following paragraphs, we use the social activities that contribute to an individual's sense of relatedness (Reis et al., 2000); as described in the beginning of the chapter) in order to assess the design requirements in this regard.

The previously stated requirement of *supporting the personalization of information* (*DR7*) is a first prerequisite for communicating personally relevant matters, and to engage in a close relationship. Schwabe et al. (2010) posit that IT-support should *allow users to establish a personal relationship during, and develop it after, the interaction* (*DR8*). This requires establishing an intimate ambiance, where the advisor listens and responds to the citizen. This can be supported by the exchange of personal information, as it fosters trust (Friedman et al., 2000), and by integrating "more trusted" information sources, such as external (*DR5.2*) information.

"*Supporting the elicitation of the citizen's true needs*" (*DR1*) is beneficial for citizens' feeling of being understood and appreciated. Schwabe et al. (2010) propose in this context that a verbal discussion on problems and possible solutions is a more natural means of collaboration and can foster corresponding perceptions. Thereby, advisors can use their expertise and empathize with the citizens to uncover hidden information needs. We summarize these aspects as *base the interaction on verbal communication* (*DR9*).

Table 2.2-1 summarizes the literature-based design requirements for IT-systems that support advisors and clients in their face-to-face citizen advisory encounters. Thereby, the individual requirements are allocated to the user's respective need for competence, autonomy or relatedness, highlighting how current research addresses users' underlying be-goals. Whereas some requirements are evaluated in the context of citizen advisory services, it remains unclear to what extent these literature-based requirements fit the work environment of public administrations' front offices, where employee's public service motivation and the general limitation on supporting resources impede establish effective support. A thorough evaluation of the literature-based design requirements can provide a sound foundation for development of design principles for citizen advisory support information systems.

| Literature-based design requirements for advisory support information systems | |
|---|---|
| ***Users' Need for Competence*** | |
| DR1 | Supporting the elicitation of the citizen's implicit needs |
| DR2 | Supporting transparency in the states of collaboration (at all times) / Increase process transparency |
| DR3 | Supporting joint problem-solving |
| DR4 | Supporting the externalization and sharing of mental models |
| DR5 | Improve information quality |
| DR 5.1 | Inform the advisory process with offline and online information resources from different governmental levels |
| DR5.2 | Integrating internal and external information |
| ***Users' Need for Autonomy*** | |
| DR6 | Support the evolution of process structure during collaboration |
| DR7 | Supporting the personalization of information |
| DR7.1 | Supporting flexible aggregation of information |
| ***Users' Need for Relatedness*** | |
| DR8 | Allow the users to establish a personal relationship among themselves during, and develop it after the interaction |
| DR9 | Foster verbal communication in the interaction |

**Table 2.2-1 The literature-based design requirements assigned to the SDT-needs**

## 2.3 Research Design and Data Collection

The question for essential design requirements emerged in the course of a larger research program investigating IT-support within face-to-face citizen advisory services. Therein, a first prototype had been developed to confirm the general feasibility of supporting citizen advisory services by means of an IT-system; the evaluation was done in a real-world setting assisting the counseling of pregnant women (see Bretscher 2009, Schenk and Schwabe, 2010, Schwabe et al. 2010).

Following the self-determination perspective, we formulated design goals related to the three basic psychological human needs for competence, autonomy and relatedness (see section 2.2). These design goals should be considered when designing IT-systems supporting self-determined users in citizen advisory services. Based on the findings of prior research, we first reviewed the current state of design requirements proposed in the literature on IT-based advisory support systems and mapped them to the design goals. Building on these insights from the *knowledge base* (Hevner et al., 2004), we conducted two "design and evaluate"-cycles (Hevner, 2007) to assess the current design requirements to see if they support, in practice, the fulfillment of the users' basic needs. According to the exploratory nature of the study, we assessed the extent to which the system assists the fulfillment of the user's needs by observations from outside (e.g. inspecting and observing the current work environment and work practices) and supplemented our findings by qualitative responses from interviews conducted with the respective users (see Stebbins, 2001). Thereto, we i) specify a *context of use* (section 2.4), ii) develop appropriate *design solutions* according to the literature-based design requirements, (section 2.5) and iii) *evaluate* them in a user test (section 2.6). We followed an approach with two "design-and-evaluate"-cycles (Hevner, 2007), where we refined the design requirements, based on the key findings of a first iteration, re-implemented the design solutions, and conducted a second user test. Figure 2.3-1 depicts the paper's research design. In the following, the individual research activities are described in detail.

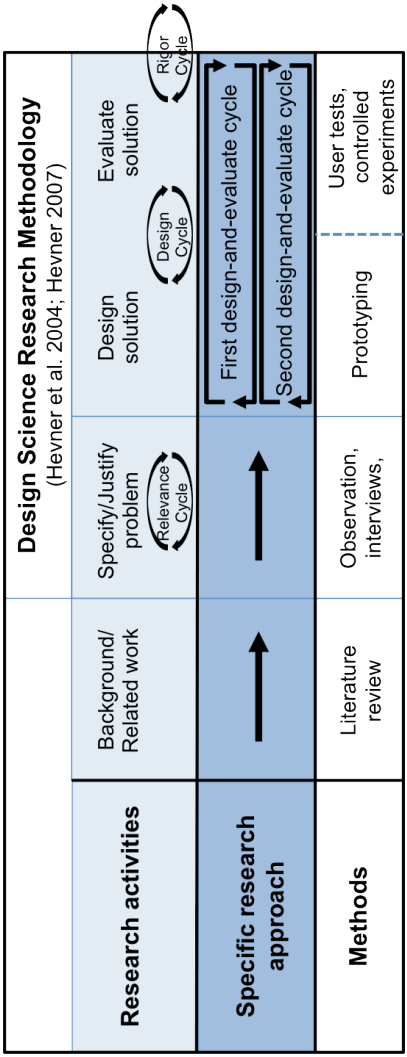


**Figure 2.3-1: Research design**

***Analyzing the context of use (for problem specification)***

We report from our comprehensive exploratory research (Stebbins, 2001) to specify the context of use for our study, namely student advisory services in

an international relations office (IRO) at the author's university. Thereby, we followed the Needs Driven Approach (Schwabe and Krcmar, 1996) to assess the advisors' work environment. Our interview guidelines based on Wilson's model for information behavior (Wilson, 1997) to assess students' and advisors' information seeking behavior. For that purpose, a total of 13 interviews (with two advisors and eleven students) were conducted. On average, an interview lasted 70 minutes. The participants in the interviews were students from a foreign country, which arrived at the university within the last 6 month and already had at least one advisory session with an advisor from the IRO. Following our self-determination focus, we assessed the current situation regarding the users' basic needs for competence, autonomy, and relatedness to disclose deficiencies in current advisory work practices, but also to assess what practices should be preserved.

***Developing design solutions (first iteration)***

According to the literature-based design requirements, we developed design solutions and implemented them in a software-prototype intended to support advisors and students in their advisory-related activities. In this first iteration of our approach, we implemented a set of design solutions and evaluated them in a user test (see evaluation paragraph below for details). In a second iteration, we refined the prototype based on the key findings from the first test. Specific design solutions were implemented in order to highlight the added value IT-support can provide to advisory services in public administrations, but also to demonstrate the problems the same IT-support can cause.

***Evaluating design solutions (first iteration)***

In the user test of the first "design-and-evaluate"-iteration, we conducted eleven advisory sessions with two advisors from the international relations office (IRO) of the authors' university and eleven students to assess the developed design solutions. These sessions took place in a small meeting room, lasted typically 20-30 minutes, and were observed by two researchers focusing on the activities and interactions of the individual participant. The advisors received a training lesson beforehand (about 45 minutes), where they became acquainted with the manipulation of the IT-tool's

functionalities and were refreshed regarding the advisory objectives. Subsequent to the advisory session, both students and advisors completed similar questionnaires and gave their feedback in a semi-structured interview. On average, these interviews lasted 30 minutes. Both the questionnaires and the interviews contained items of the participants' perceived acceptance of the IT-system (UTAUT, Venkatesh et al. 2003), their perceived satisfaction (Yield Shift Theory, Briggs et al. 2012) and their perception of the system's pragmatic and hedonic qualities (AttrakDiff, Hassenzahl et al., 2003), which has its roots in the self-determination theory. Following an explorative approach, using qualitative data, we focus on the interviews and the observations of the participants' actual behavior, which together constitute our primary data sources.

***Developing and evaluating design solutions (second iteration)***

In the second iteration, we refined the first prototype's functional support to increase the users' ability to visualize and alter information in a higher level of detail. For this purpose, we revised the prototype and tested it with the same two advisors as in the first test by conducting eight student advisory sessions. Therefore, the experimental setup was changed to a within-subject design in order to facilitate comparison between the two systems. Both advisors used the old and the new prototype in equal parts to give advice to students. We ensured that all students experienced both situations. Some started with the old situation, whereas others started with the advisory session supported by the new prototype. The rest of the experimental setup was equal to the first evaluation (20-30 min advisory session, 45 minutes of training for the advisors, two observers within the advisory sessions). However, in the subsequent interviews with the advisors and the students, we focused on the comparison of the two IT-tools and compared the responses from the interviews with the observations made during the advisory sessions.

In section 2.6, we report on the evaluation results to discuss the literature-based requirements from the self-determined users' perspective, and

develop a final catalogue of design requirements, whose implementation should plausibly foster the users' need fulfillment, i.e., their satisfaction.

## 2.4 Context of Use: Student advisory service

A major task of the international relations office (IRO) is to give assistance to foreign students, e.g., visa-related issues, finding accommodation, or registering with authorities. Conventional work practice is oriented towards providing all relevant information before students arrive. For that purpose, printed information (brochures, leaflets, forms, etc.) is sent to the students, and is also presented on the university's Web sites. Students can also contact the IRO via e-mail, telephone and during open consultation hours on a first-come, first-served basis.

Face-to-face advisory services are provided at a counter consisting of a large bar table attached to the wall on which a computer is placed. The student and the advisor stand next to each other so that documents can be placed on the table and the computer screen can be jointly viewed. The advisor sometimes presents the desired information directly on the Web sites of an authority. Bookmarks, maintained collaboratively by the advisors, are used very often to navigate quickly to the right site – reflecting the students' recurring information needs.

There is no pre-defined advisory-process. Instead, in most encounters the IRO-advisor responds to questions of the student and answers them in the ensuing dialogue. The results of an advice-giving session are also not documented systematically. Sometimes students take notes (e.g., the URL of the Web sites), or they are presented with a printout of the Web page or brochures, etc.

In the following sections, we provide illustrative examples of how the self-determinations theory's dimensions competence, autonomy, and relatedness are addressed by the conventional practice of advice-giving, as seen from the students' and advisor's perspective. The findings are drawn from the

observations and interviews that were conducted with the advisors and the students.

### *2.4.1 Competence in Conventional Advice-Giving*

Whereas for students competence signifies having sufficient information to resolve their problems on their own, the advisors' association of the term predominantly refers to the ability to provide sound information.

Within the current work practices, the students constantly suffer from having "insufficient competence." This can be seen in the predominant task of providing information by the IRO-advisors. As the advisors restrict themselves to answering explicit questions and providing the corresponding information, students do not get any methodical knowledge to resolve future similar requests on their own. Accordingly, as reported in the interviews, students developed their own strategies comprised of a network of experience-based information sources, e.g., friends, family, online forums and blogs for expatriates. In summary, it seems that the advisors' current practices did not adequately foster the student's perceived competence.

The IRO-advisors' vocational training follows a learn-by-doing principle, i.e., start giving advice and asking colleagues if problems with students' requests occur. They also used a bookmark list on the shared computers to profit of the other advisors' experience. Accordingly, the advisors relied (at least in the first few advisory sessions) on the bookmark list and the quality of the information provided there – including non-functioning Web links. Such an environment where the students could see when advisors had to ask someone for help, or needed to search for solutions due to insufficient information sources, hampered obviously the advisors' need to appear competent in the eyes of their clients.

### *2.4.2 Autonomy in Conventional Advice-Giving*

The individual's sense of autonomy is closely related to the perception of freedom of choice. In conventional student advisory services, the

predominant interaction pattern – a question-answer scheme – suggests a distinctive role allocation: the advisor uses his competencies and knowledge to deliver answers and solutions to the student's information need, as interpreted from the question asked.

The students, on one hand, can "control" the advisor's behavior with their questions, i.e., the students can get the desired information personalized to their problems. On the other hand, the observed advisors' behavior shows that they concentrate only on giving answers, but provide no background information that would be vital for related needs. The advisors gave reason to this behavior by referring to their counseling objective of bringing "students to autonomy." In summary, the advisor's autonomy is low in the conventional advisory practice; however, it is unclear if this matches their perception.

### *2.4.3 Relatedness in Conventional Advice-Giving*

Concerning the need for relatedness, the advisor and the student both strive to feel related (1) to one another and (2) to their respective social environment. The conventional work practice of IRO-advisors focuses on the students' sense for relatedness. In other words, the advisors establish a personal relationship with the student for the duration of the advisory session. Accordingly, as evidenced from the questionnaire results, the students highly valued the advisor's social skills (judged on average 6.4 on a Likert scale where 7 equals the positive maximum). Notably, students showed in their information seeking behavior that they predominantly referred to information sources from personal experience (e.g., former exchange students or forums for expatriates), but the advisors did not refer to this aspect of relatedness.

The advisors' need for relatedness is fulfilled only to a small extent. The examples of the shared bookmark list (see above) signify the main activities fostering relatedness within the actual session. The advisors also criticized the current possibilities of professional interaction and gave rationale regarding unsuitable resources (including IT means) available to them.

## 2.5 First Iteration: Assessing the Design Requirements

We report from the first "design and evaluate"-cycle (Hevner, 2007) to show whether the literature-based design requirements do meet the three design goals, i.e., helping to fulfill the advisors' and students' needs for competence, autonomy and relatedness. We, thereby, draw conclusions on the evaluation's findings and propose refinements.

### *2.5.1 Design Solutions*

To assess the literature-based design requirements (see Table 2.2-1), we contextualized them within the real-world setting of a student advisory service at the IRO (described in the previous section). We developed appropriate design solutions and implemented them in a software-prototype. The IT-tool supports the elicitation and documentation of the advice-seeking citizen's needs as well as the proposed solutions. The participants can jointly interact with the tool in order to retrieve and visualize the organization's pre-configured information for this advisory session. In the following paragraphs, the instantiation of the design solutions are described and illustrated. For the technical implementation, we used Silverlight (XAML) for the UI-Design and C# with the .NET Framework 3.5 in the back end.

At the beginning of the advisory session, an advisor from the IRO (Sally) and a student (Kate) take a seat in front of a large touch-sensitive screen (HP Touchsmart, see Figure 2.5-1) and start talking about Kate's requests. Hearing of Kate's problem how to get a job, Sally opens a new memo card and labels it "getting a job" (*DR 4, 8;* see Figure 2.5-2 on the left). The memo card contains different functions: 1) The client's request can be noted down, 2) Adequate solutions can be added and, 3) The card is part of a "drag and drop" construct to support the forming of a personalized advisory process. Therefore, the memo cards act as central element in the advisory support artifact.

Before Sally starts to solve the first problem, she asks if there are other issues that Kate wants to discuss (*DR9*). In the course of the conversation, Sally adds two more memo cards, "health insurance" and "public transportation possibilities" (see Figure 2.5-2). She then opens a list in the upper left corner of the screen, noting that there are recurring problems facing students. She mentions to Kate that if she sees some interesting topics, she should click on them to generate pre-completed cards, which they could discuss later (*DR1*). Finally, Sally groups the memo cards on the screen by shifting them around with her finger, thus establishing a (simple) process structure that suits her and Kate for the subsequent problem-solving (*DR 3, DR 6*).

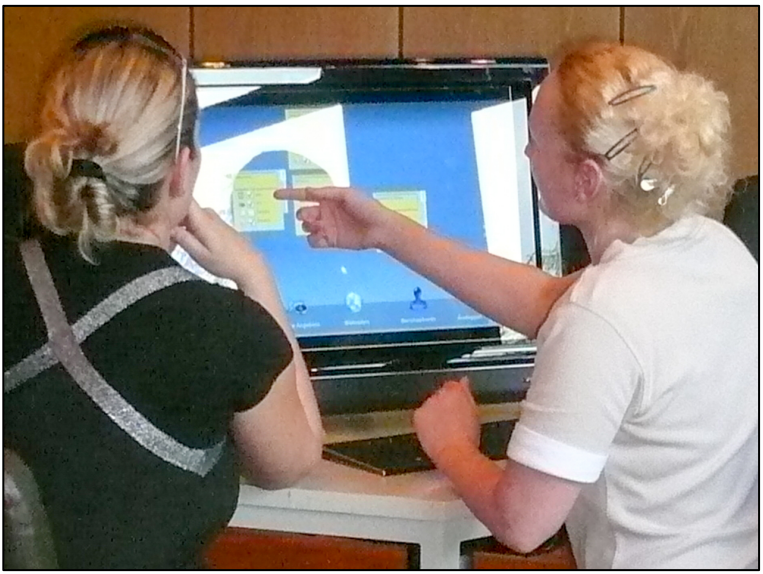

**Figure 2.5-1: General physical setup in IT-supported citizen advisory service (picture from Bretscher (2009))**

Picking the first memo card "getting a job," Sally shows Kate a Web site with job offers suitable for students, e.g., part-time with flexible working hours (*DR5*). For this purpose, she moves the concrete problem memo card with her finger on the "Web site" icon at the bottom and navigates it to the corresponding screen (see Figure 2.5-3 above). By physically keeping hold of

the problem and taking it with her into the next advisory phase of designing an appropriate solution, Kate could follow the advisory process more easily. Sally now chooses from a list of governmental, university and, third party Web sites, as well as online forums for expatriates (*DR5*) one covering job markets and displays it. After a short discussion of the job category suitable for Kate's situation, Sally adds the Web link to the problem memo card (see Figure 2.5-3, on the right side of the prototype's screens) (*DR7*).

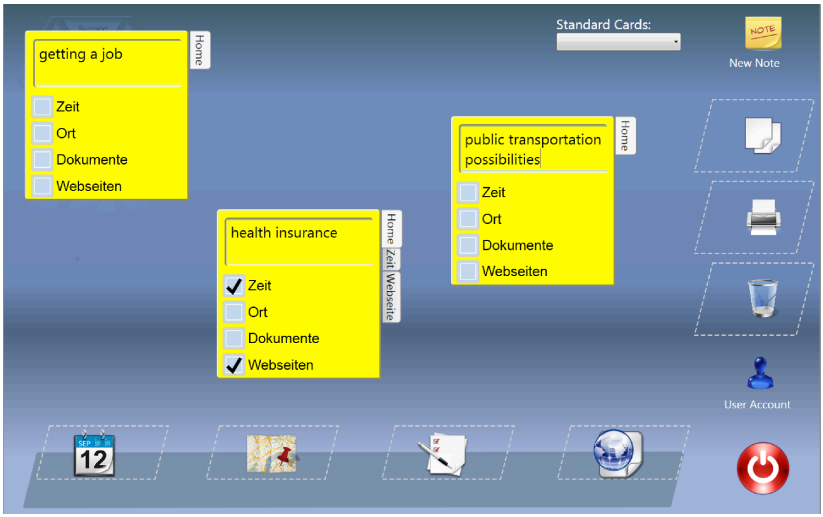


**Figure 2.5-2: Main screen of the software-prototype**

They continue to process Kate's problem by reviewing government information on work law. Sally also supplements this information with some additional useful hints from her (*DR 7, 8*). She mentioned that Kate has to have a work permit and that she has to visit the local authorities' office to apply for one. Thereto, Sally changes to the planning screen of the IT-tool (see Figure 2.5-3, below), discusses with Kate what date would be suitable for her to make this visit and added it to the memo card. In doing so, she verbally added useful information like what documents to bring along. Subsequent, they return to the main screen and agree on "closing the card", i.e., end the problem-solving process (DR2).

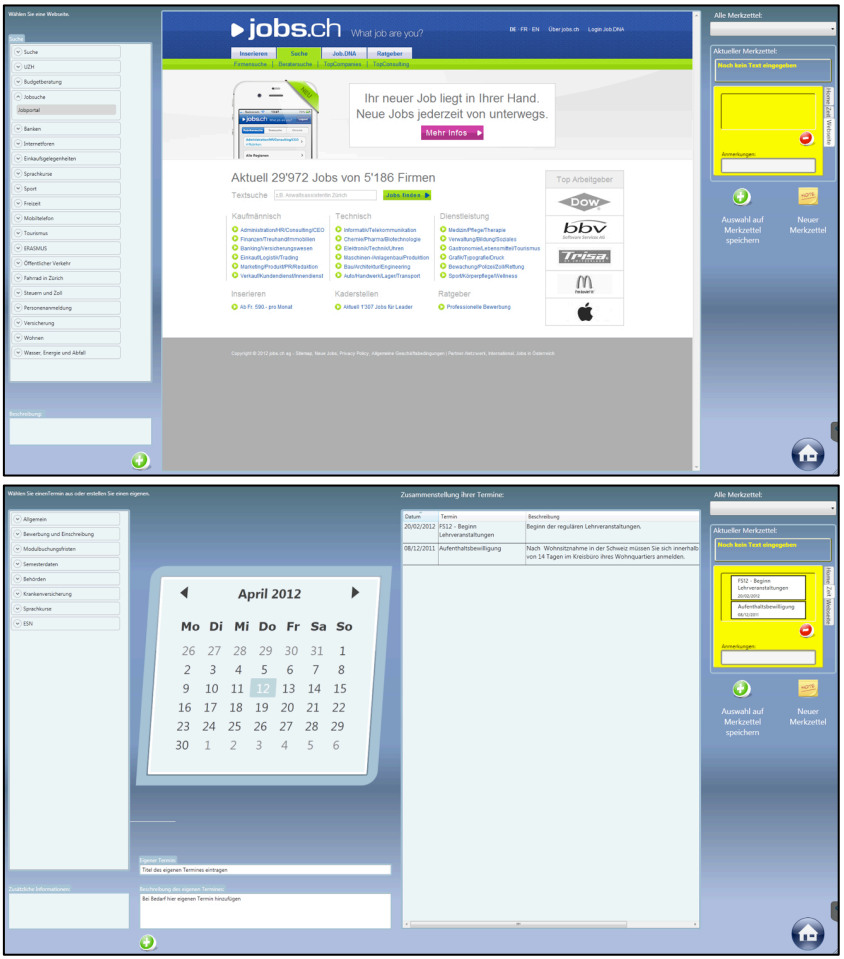


**Figure 2.5-3: Website screen (above) and planning screen (below) of the software-prototype**

In this way, Sally and Kate work through all preliminarily created memo cards. After finishing the last one, Sally explains to Kate that she could either send her all the information that they gathered by e-mail, or she could print it for her. As Kate would like to receive it electronically, she gives Sally her

e-mail address. They conclude the advisory session with Sally wishing Kate all the best on her job search.

### *2.5.2 Insights from the first evaluation*

In the first iteration's evaluation, two advisors used the developed IT tool to give advice to eleven (foreign) students regarding their "living and studying in a new country" and report on their experiences (see section 2.3 for further details on the evaluation's setup).

Whereas the students in our tests valued their perceived satisfaction with the IT tool well (on average 6 on a Likert scale where 7 equals the positive maximum), the advisors were moderately satisfied (on average 4.75). Although these subjective user statements support the impression that their expectations were met, but the users' underlying basic needs were fulfilled to a varying extent. Therefore, we want to discuss the evaluation results in more detail.

#### *2.5.2.1 Users' need for competence*

In the test sessions, the students valued the information and instructions received as being comprehensible and useful; they also perceived themselves to be competent in solving their personal problems using the received information. The students appreciated the links between the problems and the solutions noted on the memo cards – a significant feature they missed in the traditional advisory situation. Further, the virtual memo cards made it easier for them to recall the stage of the advisory process (or the distinct problem-solving process "on one card") in which they were currently engaged. In particular, the advisor's arrangement of the cards seemed to be a useful structuring aid, not just enhancing the transparency of the advisory process, but also giving students the required knowledge to participate actively.

As public administrations rarely see themselves to the same extent as service providers as private sector firms, many advisors in public administrations

do not have an advisory-related background where clients are seen as customers. Nevertheless, advisors in public administrations want to exert their advisory-related skills. For them, some of the most important skills are competent information provision and professional guidance through the advisory process. As to the first objective, the advisors made extensive use of the (different kinds of) information sources provided, and thus responded more in depth to the students' individual problems. This was described not only by the students as being "more individualized service", but the advisors also described this way of working as a "more satisfying information provision".

Concerning the second part of the advisors' need for competence, their methodical skills, they appreciated the memo cards because of the possibility of structuring the advisory session while still being able to customize it at any time. Although the "memo card"-metaphor performed well in this respect, it did not address the advisors' weakness in adopting a proper advisory process (Schwabe et al. 2010).

The information provided by the IT-system reflected the document-centric work practice, as it appears in work environments in today's public administrations. In consequence, individual information elements, e.g., information brochures, forms or legal texts, are frequently designed to be widely applicable, but hardly customizable, as they couldn't be decomposed in a suitable way. However, during the user tests, the advisors often wanted to access information on a more detailed level in order to provide clients a more customized advisory service. In consequence, the advisors appreciated the simplified access to the desired information enabled by the IT-system, but remarked their wish for more detailed information. Thus, we suggest that information must generally be provided on finer levels of detail, so that it can provide the necessary added value to the advisory session. Therefore, we argue that the design requirement *DR5* should be supplemented with *DR5.3*: *Provide detailed information*.

#### 2.5.2.2 *Users' need for autonomy*

The observations in our test have shown that the advisor is de facto the only user directly operating the IT-tool. However, the students perceived themselves to have sufficient possibilities of influencing the advisory session's course of action by observing every activity in the information system and having the possibility to intervene whenever necessary. Thus, their perception of autonomy did not appear to suffer. The correspondent measurements of the system's hedonic qualities back these statements (on average 4.27 on a Likert scale). Further, the students reported that by using the IT-tool, the advisor was able to respond in a more individual way; consequently, they perceived themselves as being more in the advisor's center of attention.

Even though not noticed by students, the advisors showed clear deficiencies in certain phases of the advisory process, e.g., in verifying whether the advisory goals had been achieved. During the tests, the advisor did not finish the advisory session, for instance, by providing a big picture of the student's problems and corresponding solutions. Instead, they proposed that students should "come back if there were any ambiguities". As IT can provide substantial added value in this respect, we recommend that advisory supportive IT should *support the advisory structure with mandatory activities* (*DR6.1*). This means that important advisory activities, e.g., externalizing the client's needs, would have to be carried out. But to preserve the users' (perceived) autonomy, in contrast to a given process structure, advisors and citizens would be free to decide when to accomplish the mandatory activity.

In the tests, the developed software-prototype supported its users in their flexible information aggregation that contributes to solve the students' problems. The advisors as well as students recognized this clearly as an added value: The students felt that the obtained information was tailored to their situation and the advisors welcomed the flexibility how they could aggregate the information. However, the advisors criticized that they could

not supplement this information with their experiential knowledge what would have been – according to them – a better strategy to adapt to the student's evolving information needs. This finding should be addressed and appropriate IT-support provided since this signifies one of the key characteristics of public administration. In order to better assist advisors and clients in personalizing their advisory encounter, the corresponding design requirement (*DR7*) should be expanded with *DR7.2: Support the annotation of information*.

#### *2.5.2.3 Users' need for relatedness*

The students' expectations with respect to their need for relatedness focus mainly on their relationship to the advisor. In the context of citizen advisory services, clients commonly assign the advisors good social skills. In this regard, the students in our test sessions perceived the IT-tool as "ideal externalization and documentation of the verbal discussion and the solution finding process." For this reason, the IT-tool seemed to fit well in the dyadic advisory encounter, supplementing the personal relationship between the advisor and the student. This is an important objective for advisory supportive IT, considering the fact that deployed IT often acts as a communicational barrier in advisory sessions (Rodden et al., 2003).

The advisors associated with their perception of relatedness (1) with the client and (2) with their colleagues at work. Regarding the first aspect, the observations of the advisors' behavior revealed that they tended to separate the used IT-tool from students. This means, that advisors engaged in an intense verbal discussion with students and neglect their task of encouraging students' IT use, thereby integrating them as equal collaboration partners. The advisors gave rationale to this behavior by referring to their work motivation as: "get to know people from other cultures and their experiences." Accordingly, the users' conceptions of counseling seem to influence users' behaviors and IT tools' developers should take this into account.

The second aspect of the advisors' sense for relatedness concerns their professional and social interactions with their colleagues at work. As this refers strongly to the advisors' vocational qualification phase, it could not be assessed in the tests conducted. However, the observations of the current work practices (see section 2.4) highlighted the advisors' need for an adequate IT-supported solution. Respective IT-support should establish a learning community, where the advisors could *communicate with one another and interchange professional knowledge* (*DR10*). This has already been suggested by Wang (2003) as a requirement for electronic learning system.

Table 2.5-1 shows the set of design requirements resulting from the first iteration of the "design and evaluate"-cycle. The new requirements resulting from the observations of the first trial are marked in bold.

| One time assessed design requirements for advisory support information systems | |
|---|---|
| ***Users' Need for Competence*** | |
| DR1 | Supporting the elicitation of the citizen's implicit needs |
| DR2 | Supporting transparency in the states of collaboration (at all times) / Increase process transparency |
| DR3 | Supporting joint problem-solving |
| DR4 | Supporting the externalization and sharing of mental models |
| DR5 | Improve information quality |
| DR5.1 | Inform the advisory process with offline and online information resources from different governmental levels |
| DR5.2 | Integrating internal and external information |
| **DR5.3** | **Provide detailed information** |
| ***Users' Need for Autonomy*** | |
| DR6 | Support the evolution of process structure during collaboration |
| **DR6.1** | **Support structuring with mandatory activities** |
| DR7 | Supporting the personalization of information |
| DR7.1 | Supporting flexible aggregation of information |
| **DR7.2** | **Allow annotation of information** |
| ***Users' Need for Relatedness*** | |
| DR8 | Allow the users to establish a personal relationship among themselves during, and develop it after the interaction |
| DR9 | Foster verbal communication in the interaction |
| **DR10** | **Enable professional interaction between advisors** |

**Table 2.5-1 Set of design requirements for advisory supportive IT after the first evaluation (additions marked in bold)**

## 2.6 Second Iteration: Refining the Design Requirements

For better understanding of the design requirements, its effects on advisors and citizens, and ultimately deepen our knowledge on their successful implementation, we refined the first prototype based on the key findings of the first evaluation.

### *2.6.1 Refinements*

We adapted the design requirements *DR7.1* and *DR7.2* (dealing with the aspect of service personalization) as well as *DR5.3* (dealing with the level of detail of the information stored within the advisory support tool). Therewith, we wanted to provide the advisor with better IT-support to guide the client through their collaborative advisory encounter and to personalize the developed solutions in a more detailed level. In the second „design and evaluate“ cycle, the prototype's functions to visualize and modify time-related information were revised and some new visualization and interaction possibilities were added to them (see Figure 2.6-1). This opened up the opportunity to show time-related information on a fine-grained level and to allow students and advisors to modify, and thus personalize, these information items. In the first prototype, a “standard” calendar entry had to be selected from a table (see left side in both pictures of Figure 2.6-1) only allowing personalization by changing the exact date with the help of the calendar. The advisors in this first test remarked that in doing so, they cannot adequately apply their experiential knowledge for the students' benefit: They were able to talk about everything orally but at the same time, the advisor was incapable of document this information with the help of the existing prototype. To tackle this problem, the second prototype (see Figure 2.6-1 on the right) offers an additional window for each selected calendar entry that will show more details and allows their modification at the same time. For example, it was now possible to edit the description of a calendar entry. This helps an advisor to adapt and personalize information

to a student's specific needs. The next section portrays how these modifications contributed to a different usage of the IT-system and how they helped to achieve the three design goals.

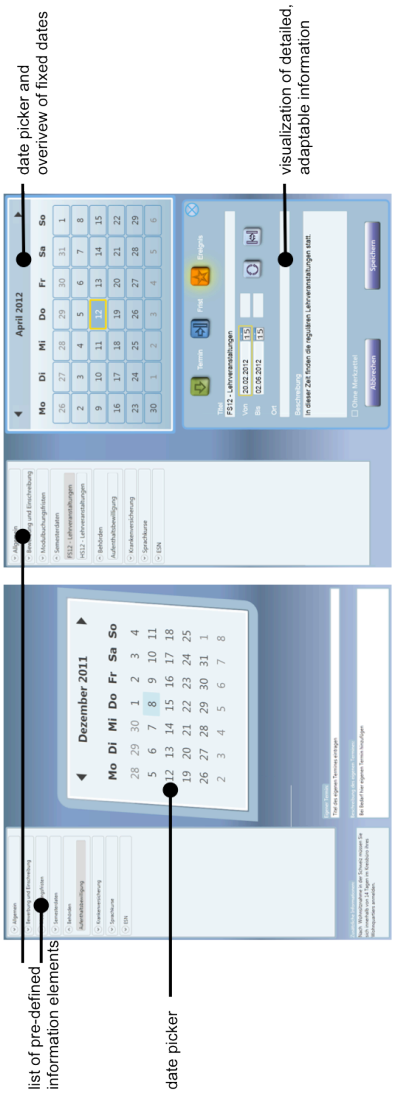


**Figure 2.6-1: Providing detailed and adaptable information: the "planning"-part of the time screen in the first prototype (left) and the second prototype (right)**

### *2.6.2 Insights from the second evaluation*

In the second iteration's evaluation, the test setting had to be changed in order that advisors and students could do a comparison of the first and second, revised prototype. Thereto, a within-subject test design was applied to facilitate comparison (see section 2.3 for evaluation details).

Overall, the advisors and the students appreciated the revised prototype (*satisfaction* was judged on average 5.9 for the advisors and 6.23 for the students on a Likert scale where 7 equals the positive maximum) and clearly favored the revised over the old design. However, the observations and the insights from the qualitative interviews with the advisors revealed serious drawbacks of the improvements made to the IT-system. In the following paragraphs, we want to highlight the findings from this second evaluation in order to again improve the design requirements.

#### *2.6.2.1 Users' need for competence*

Initially, all stakeholders welcomed the increased level of detail with respect to the information provided by the new prototype. On one hand, the advisors appreciated the additional informational depth as they could use it to find more suitable solutions together with the students, i.e., the prototype supported them concerning their professional competence. On the other hand, longer periods where advisors and students focused only on the tool were observed causing their verbal conversation to interrupt. We argue that this is due to the more comprehensive provision of information: The advisors felt obliged to explain all the information provided by the system. Therefore, they also tried to explain information to the student that was less familiar to them. In consequence, advisors and students needed more time to process these more detailed information. In addition, the advisors felt less satisfied in retrospective, as they had to reveal knowledge gaps in front of the student unintentionally. During the test sessions, the advisors started to bypass this issue by omitting entire blocks of information and thus also started to deteriorate the information quality. In consequence, we argue that one has to ensure that providing supporting tools and information resources

did not negatively affect the advisor-client-interactions (we introduce this as a constraint for the design requirements, but will address it in detail below as it also affects the other requirements).. Based upon the empirical observations, we conclude that information should be provided within different levels of detail. This enables the advisors to integrate information into the advisory session at the appropriate level of detail. In practice, this means that the advisors then could choose the appropriate level of detail they want to explore together with the students, according to their assessment of the students' knowledge needs. Steinmetz (2011) made similar observations in context of citizens' services over the telephone. Therefore, we want to refine the design requirement dealing with information quality (*DR5*) with *DR5.3 Provide different levels of detail*.

#### *2.6.2.2 Users' need for autonomy*

To support the advisors' autonomy, comment fields for personal notes were integrated in the new prototype. Therewith the advisor had the ability to complement the existing information with their experiential knowledge. During the second user test, the students appreciated this additional functionality as it helped the advisor to personalize the information better (supporting *DG3*) in their concrete situation by sharing their expertise more easily (supporting *DG 1*). As observed in the tests, the advisors and students always had the freedom of choice whether they wanted to annotate the information provided and to what extent. However, an even bigger problem appeared which is typical for the domain of public administration: Information is provided often on a generic level, so that it is widely applicable. Therefore, documents, e.g., brochures, leaflets, etc., are often distributed as whole information units, whereas single extracts would have been better. However, the advisors especially criticized this document-centered work practice. They mentioned that they could not access integral parts of the information provided. Thus their annotations could not be allocated accurately. The advisors had to attach explicit explanations regarding the association of their annotations with an integral part of an

informational item. In doing so, it interrupted their flow of conversation with the student, as the student waited for the advisor to finish typing the "meta information". As a consequence, *DR7.1* should be refined to *allow annotation on fine-grained information*. In addition, we want to state the general constraint that the implementation of a design requirement, i.e., the respective functions or their use during the advisory encounter, should not affect the direct advisor-client communication. As this constraint should be applied to all design requirements (see description below), it will not be added to *DR7.1* solely.

#### *2.6.2.3 Users' need for relatedness*

Regarding the first two design goals – to increase competence and autonomy – the stakeholders in the second test frequently made positive experiences using the revised software prototype. This was significantly different concerning the third design goal aiming at increasing the users' relatedness. For the second prototype, it was observed in the test that the IT-system dominated the advisory encounter much more. Compared to the situation supported by the first prototype, the advisors and the student's attention increasingly shifted on the IT-tool. The stakeholders' relationship suffered, as their verbal conversation was interrupted, triggered by longer periods of intensive interaction with the IT-tool. Advisors and students confirmed that a more impersonal advisory atmosphere was created. Within citizen advisory services, the verbal communication between the advisor and the client is very important and should not suffer from the introduction of IT-support. Accordingly, a general constraint applicable to all design requirements can be stated, originating from the perspective on the users' relatedness: *Implemented functions and their use should not affect direct advisor-client communication*.

To summarize our insights from the two "design and evaluate"-cycles, Table 2.6-1 shows the final set of design requirements. The new or adapted requirements resulting from the findings of both user tests are marked in bold. Thanks to our iterative approach and by applying a self-determination perspective, we could therewith create a 'better-founded catalogue of design requirements for advisory support information systems.

| Generic Design Requirements for advisory support information systems | |
|---|---|
| *Constraint (affecting all DRs)* | **Implemented functions and their use should not negatively affect direct advisor-client collaboration.** |
| ***Users' Need for Competence*** | |
| DR1 | Supporting the elicitation of the citizen's implicit needs |
| DR2 | Supporting transparency in the states of collaboration (at all times) / Increase process transparency |
| DR3 | Supporting joint problem-solving |
| DR4 | Supporting the externalization and sharing of mental models |
| DR5 | Improve information quality |
| DR5.1 | Inform the advisory process with offline and online information resources from different governmental levels |
| DR5.2 | Integrating internal and external information |
| DR5.3 | Provide detailed information |
| ***Users' Need for Autonomy*** | |
| DR6 | Support the evolution of process structure during collaboration |
| **DR6.1** | **Support structuring with mandatory activities** |
| DR7 | Supporting the personalization of information |
| DR7.1 | Supporting flexible aggregation of information |
| **DR7.2** | **Allow annotation of information** |
| ***Users' Need for Relatedness*** | |
| DR8 | Allow the users to establish a personal relationship among themselves during, and develop it after the interaction |
| DR9 | Foster verbal communication in the interaction |
| **DR10** | **Enable professional interaction between advisors** |

**Table 2.6-1 Final set of design requirements for IT-systems supporting self-determined users in citizen advisory services; additions and modifications are marked in bold**

## 2.7 Discussion

Taking on a self-determination theory perspective allowed developing a comprehensive set of generic design requirements for advisory support information systems empowering front office employees and citizens comprehensively in their advisory collaboration and ultimately improving their individual service satisfaction. Focusing on the actors' underlying be-goals with their motivational background, allowed us, first, to uncover requirements, which would not have been found otherwise. Second, we could assemble the design requirements that allow the advisory service encounter to become a service experience for advisors and clients, as Prahalad and Ramaswamy (2004a) or Hassenzahl (2010) called for.

Evaluating and refining literature-based design requirements in two design-and-evaluate cycles helped us to disclose some of the essential aspects that should be considered when designing and deploying advisory support information systems aiming to increase advisors' and clients' needs for competence, autonomy and relatedness (addressing RQ1). In detail, to increase the actors' competence, design requirements call for providing users with adequate tools and information resources to support them in their fundamental collaborative tasks and improving the quality of information used therein. To increase the actors' autonomy, they call for supporting the structuring and personalization of advisors' and clients' advisory collaboration. And to increase the actors' need for relatedness, they call for improving the actors' verbal communication. With the developed set of generic design requirements for designing IT-systems for better fulfillment of advisors' and clients' fundamental be-goals, we could, first, deepen the understanding of acceptance and adoption of ICT in the dyadic collaboration of a advisory service encounter. Furthermore, with extending the view on both participants in the advisory collaboration, advisors as well as clients, and their needs we could complement previously one-sided approach studying service quality or service satisfaction, e.g., Parasuraman (1988) or Cronin and Taylor (1992), with adding a comprehensive analysis of the

service encounter from its users, as Bradley et al. (2010) already started. The resulting set of design requirements, founded on the actors' fundamental be-goals, helps developers of advisory support information systems to understand what users actually need and provide them with comprehensive guidelines for improving system design, that should substantially foster users' service satisfaction.

In our explorative study, we could show highlight how advisory support information systems should be designed to take the characteristics of public administrations' front offices into account, like e.g., employee's intrinsic work motivation or the general lack of training resources (addressing RQ2). Reviewing current research literature on advisory support information systems revealed that most approaches are designed to support advisors enhancing their already existing advisory skills, (c.f. Schmidt-Rauch et al. (2010) in the context of advisory services in travel agents or Nussbaumer et al. (2012) in financial advisory service. However, in the organizational context of public administrations' front offices, these approaches are rather ill-suited. Public employees do rarely possess the advisory-related skills needed for providing sound advisory services (cf. Giesbrecht et al., 2011; Lenk and Klee-Kruse, 2000; Lenk and Schuppan, 2011; Schenk and Schwabe, 2011, 2010). In this context, front office employees in public administrations could not just "make use" of provided information systems and immediately benefit from its support, but they need to be treated as learners learning about novel advice-giving behaviors and developing corresponding capabilities to become skilled advisors. For this purpose, appropriate and sufficient guidance has to be provided for such learners, as Kirschner et al. (2006 quote) pointed out. Thus, we argue that citizen advisory support information systems need to provide appropriate guidance for front office employees to acquire new knowledge and skills and learn about new advice-giving behaviors. In this context, the design requirements (cf. Table 2.6-1) do possess some items with "guiding" character, e.g., "Support structuring with mandatory activities" (DR6.1). Nevertheless, current researchers rarely implement comprehensive guidance concepts in their support approaches and in consequence frequently contain elements that only can be handled by

skilled advisors, rather than non-expert service personnel as the public front office employees.

Providing such guidance face additional challenges in the organizational environment of the public administrations characterized by i) scarce teaching resources with no money and time for teaching staff or additional time for training off-the-job (Lenk and Schuppan, 2011) and missing customized auxiliary means (Lenk and Klee-Kruse, 2000; Schenk and Schwabe, 2011), and ii) difficult-to-incentivize learners in form of the public employees with their public service motivation (Anderfuhren-Biget et al., 2010; Buelens and Van den Broeck, 2007; Grant, 2008; Rainey, 1982). Furthermore, support measures should not interfere with the advisor-client collaboration, as Heinrich et al. (2014) highlighted the severe effects of inappropriately designed or deployed IT-artifacts. We argue that to account for the organizational conditions, requirements and constraints, researchers need to include the learning needs of front office employees comprehensively into their design considerations and create suitable advisory support that guides front office employees toward improving their advice giving behavior and ultimately toward better service satisfaction and service quality.

The developed set of generic design requirements (cf. Table 2.6-1) provide a well-founded base for developing design principles, which represent the fundamental design concepts for successfully creating advisory support information systems that empower advisors and citizens in their advisory service encounter. However, in design-oriented research, it is often difficult to generalize the findings concerning a specific artifact to a class of artifacts (i.e., from design requirements to design principles): The effects measured or observed could be caused due to the specific instantiation's design or due to specific characteristics of the organizational or social context in the evaluation. And ultimately, the artifact's success depends on its meaningful use within a beneficial environment. To cope better with these circumstances and advance our research on advisory support information systems, we suggest including detailed measurements for the individual user's need

fulfillment as s/he perceived it, which were not yet applied in this explorative study. Corresponding measurement tools could be the *Intrinsic Motivation Inventory* (Deci and Ryan, 2003, based on 1985) as well as Spreitzer's "psychological empowerment in the workplace" (Spreitzer, 1995), which both help to assess individuals' perception of competence and self-determination as well as their intrinsic work motivation.

## 2.8 Conclusion and limitations

In this article, we investigated the design of IT-artifacts supporting face-to-face citizen advisory services. We argue that in order to develop sound design theories for advisory support information systems, researchers have to take on a more holistic view on the system's users: Not only the actions that users perform during the advisory service encounter, i.e., their do-goals and their motor goals, have to be considered, but also their motives and needs, i.e., their be-goals (Hassenzahl, 2010). By applying self-determination theory as perspective on advisors and clients with their individual needs for competence, autonomy and relatedness, we could assess and refine design requirements from existing research literature and develop additional ones, which would hardly have been disclosed otherwise. Thereto, we followed a design science approach, where we developed design solutions for the corresponding design requirements and integrated them in a prototype of an advisory support information system in order to evaluate them. We presented our findings from two "design and evaluate"-cycles (Hevner, 2007) wherein we conducted advisory sessions in a real-world context of an advisory service for "new-in-town"-students to evaluate and refine the literature-based design requirements. Finally, we elaborated a set of well-founded design requirements (cf. Table 2.6-1) whose implementation should substantially foster users' service satisfaction. Therewith, we also want to contribute to the ongoing research discussion on information system design by highlighting the benefit of integrating users' motives and needs into design consideration.

Basing our approach on the self-determination theory allowed us to broaden our understanding of front office employees' and citizens' behavior in their face-to-face service encounter. We highlighted the relation between the users' innate needs for competence, autonomy and relatedness, and their satisfaction with the advisory service, either receiving it as a client or providing it as an advisor. In doing so, we were thus able to build a better-founded catalogue of generic design requirements for the class of citizen advisory support information systems. With this catalogue and the self-determination theory as kernel, we could take an important step forward in building of a conceptual design model for citizen advisory support systems (see Walls et al., 1992 or Gregor and Jones, 2007). We suggest that further research should include the assessment and enhancement of the developed design requirements by considering additional models describing user satisfaction and its underlying motives from other perspectives (e.g., Briggs et al., 2012; Carter and Bélanger, 2005; Erpenbeck and von Rosenstiel, 2007; Spreitzer, 1995). Furthermore, comprehensive models describing the determinants of user behavior in citizen advisory services, should be developed, as they represent a necessary prerequisite to understand user behavior and, hence, for the development of useful design models.

Our explorative study revealed that previous research hardly addressed the additional challenge occurring in the organizational work environment of public administrations' front office, where employees rarely possess the necessary advisory-related skills and therefore need more qualification than mere support. Based on our insights from our explorative study, we argue that suitable support for public administrations' front office employees should provide sufficient guidance helping front office employees to learn about new knowledge and skills. In other words, suitable support should transform front office employees' work environment into an on-the-job learning environment.

Whereas working with actual advisors and clients allowed us deep insights, our research approach comes with certain limitations: Whereas the limited number of test participants suits the explorative character of our study, tests

with larger number of advisors and clients need to be conducted to generalize our insights and advance design research. Furthermore, the evaluation of the literature-based design requirements was done with advisors within an individual organization. And while research literature indicate that the essential characteristics of the work environment of front office employees in public organizations apply in general, we advice for further research to first assess the organizational preconditions before transferring our insights and applying the design requirements to design and deploy suitable support.

# 3 FROM FACILITATION TO COUNSELING AFFORDANCES: ON-THE-JOB EMPOWERMENT OF FRONT OFFICE EMPLOYEES

Research essay II[2]

***Abstract***

*How can front office employees be qualified to provide sound customer advisory services? How can they be empowered to deliver to customers the added value of public sector modernization? We offer a novel approach to qualify service personnel on-the-job using counseling affordances. Artifacts equipped with appropriately designed counseling affordances are introduced into service personnel's work environments. These counseling affordances invite employees to start experiential learning and, hence, to improve their advice-giving behavior. We follow a design research approach, developing six design principles for equipping artifacts with counseling affordances. We test our approach in the context of citizens' advice services in public administrations. We implemented a prototype IT artifact and conducted two design-and-evaluate cycles with 18 real-world advisors and 48 clients to assess our on-the-job qualification approach. Preliminary results show that learning with counseling affordances promises to be an effective approach to initiate experiential learning on-the-job and thus to help front office employees to learn about and provide superior advisory services. With the proposed qualification approach and the design principles for counseling affordances, we furthermore highlight the beneficial relationship between affordances and on-the-job learning and provide practitioners with useful guidelines to implement the "learning with counseling affordance" approach in their organizations.*

[2] Research essay II builds on previous publications, namely Giesbrecht et al. (2011) and Giesbrecht et al. (2014). It represents an extended version of Giesbrecht et al. (2014). The essay is co-authored by Gerhard Schwabe, University of Zurich and Birgit Schenk, University of Applied Science Ludwigsburg, and currently under review at the Journal of Transforming Government: People, Process and Policy.

## 3.1 Introduction

An increasing number of organizations seek to distinguish themselves by offering superior service. A critical point is the face-to-face *service encounter*, where service personnel advise clients. How can service personnel be qualified to provided sound customer advisory services? How can they learn to make best use of modern technologies to create a unique customer experience? Focusing on the public sector, different researchers showed that front office administrators today lack the necessary skills to provide the desired level of citizen advisory services (cf. Andersen, 2006; Bretscher, 2009; Giesbrecht et al., 2011; Hielscher and Ochs, 2009; Schwabe, 2011). In face-to-face advisory services, personnel face constantly altering and expanding service catalogues, changing service goals, and the introduction of new information technology. Lifelong qualification is essential. We present a novel approach to these issues: We propose to offer advisors *"counseling affordances*". Appropriately designed affordances will gently move advisors to try these during service encounters. Our working hypothesis is that these trials foster an improved advice-giving behavior.

We test our working hypothesis in the area of citizens' advice services. Today, cities increase their efforts to bind their citizens through improved service (Accenture, 2005). However, in many cases, they rely on a service agent's natural talent to give advice, which results in a large variance of service quality. Systematic training is often regarded as too expensive and – if given – service agents struggle to transfer the knowledge to their workplace. And while on-the-job training by peers has some value in transferring established knowledge, it is ill suited for novel counseling approaches. We take a more in-depth view of the situation of the public service agents in Section 3.4, while Section 3.2 provides the necessary background on advisory service encounters and front office employees' necessary skills to provide them. We then introduce our qualification approach blending *affordances* into experiential learning. In Section 3.3, we provide an overview of the research design. Following our design science

research approach, we provide a thorough problem analysis in Section 3.4. In Sections 3.5 and 3.6, we report from a first design-and-evaluate cycle where we developed *facilitation affordances*, a first set of design principles for IT-enabled on-the-job qualification. Implemented in a first software prototype, we evaluated these principles with six actual front office employees and 12 clients. We report on the first evaluation's results in Section 3.6, highlighting the facilitation affordances' beneficial effects on the employees' advisory-related skills, but also report on the occurring deficiencies that occurred, leading to a second design-and-evaluate cycle. In Section 3.7, we report from the refinement and extension of the facilitation affordances to overcome the identified deficiencies by developing the final *counseling affordances*, a well-founded set of design principles representing the principal component of our approach for on-the-job qualification. Section 3.8 presents the result of the second evaluation, where 12 front office employees and 36 clients evaluated the revised software prototype. We elaborate on the contributions of our findings in the discussion in Section 3.9. In short, they are: 1) a novel qualification approach, which is preliminarily supported in our evaluations, and 2) a set of principles for designing counseling affordances.

## 3.2 Background and Related Work

### *3.2.1 Face-to-face advisory service encounters and the skills employees need*

Central to the delivery of organizations' services are the encounters between employees and customers. In these service encounters, front-line personnel need to provide services to standards that meet the organization's demands for superior service provision, as well as to fulfill the customers' high expectations. These aspects are addressed in service marketing literature focusing on service quality and customer satisfaction (e.g., Davidow, 2003; Mouawad and Kleiner, 1996; Parasuraman et al., 1988). Researchers describe the fundamental elements of high-quality service encounters and deduce the characteristics of the service-providing personnel (e.g. reliability,

responsiveness, or empathy). In a second body of service encounter literature from work psychology and human resource management, authors focus on service sector workers and their job satisfaction, performance, or wellbeing (e.g., Bradley et al., 2010; De Ruyter et al., 2001; Dollard et al., 2003; Holdsworth and Cartwright, 2003; Holman, 2002). They emphasize the social aspects of service encounters and describe the service workers' needs, how they should be fulfilled, and their influence on service outcomes.

To provide comprehensive, sound advice in service encounters, service personnel need to master a multitude of skills: customers not only expect employees to conduct transactions, e.g., to book a flight in a travel agency or transfer money at a cashier's desk. They seek to holistically enhance their actual social situation and thus have complex information needs. In these situations, service personnel must become advisors, guiding their clients through a structured problem-solving process (e.g., Giesbrecht et al., 2011; Mutzeck, 2008; Schenk and Schwabe, 2011; Susanne Schmidt-Rauch and Nussbaumer, 2011; Simon et al., 1987): In the initial problem elicitation phase, they need to explore clients' problems and needs in order to create a thorough understanding of the client's situation. In the subsequent solution-finding phase, advisors need to search for and present possible solutions to their clients, while using available tools and information resources. Finally, they need to enable the clients to make an informed decision on which solution suits them most. Therefore, they need to constantly maintain close relationships with their clients – making them co-creators of the advisory service's product. These basic areas, in which advisors should master specific skills strongly correspond with those in the research literature on group moderation or facilitation (cf. Bostrom et al., 1993; Briggs et al., 2009; Briggs and de Vreede, 2011; Clawson et al., 1993; Hayne, 1999; Kolfschoten et al., 2006; Schwabe, 1995): a) guide clients through a structured process, and b) establish and sustain close relationships with clients, while c) in both areas applying available tools and information sources to support the various tasks. (In Section 3.5, we discuss further details on these facilitation skills.) Thus, to provide sound advice to and create a corresponding service

experience for customers, service personnel should develop the corresponding skills and should act as facilitators of the advisory service encounter.

### *3.2.2 Qualifying service personnel on-the-job*

Professional knowledge has a large and important tacit dimension (Eraut, 2000). This "know-how" knowledge must be effectively transferred to employees in order to empower them in their work environments. Here, on-the-job training is frequently superior to off-the-job measures, since it is easier to apply the gained knowledge to a personal work situation. Learning from others is one of the most frequently applied methods of learning in the workplace (Eraut, 2004; Skule, 2004). Organizations use peer-to-peer methods like shadowing, apprenticeship, mentoring, coaching, or creating informal communities of practice (cf. Eraut, 2007; Guile and Griffiths, 2001; Skule, 2004) to qualify their employees. They want to shorten the "fit for work"-time and to ensure that employees acquire all skills and explicit or tacit knowledge necessary to provide sound customer services. However, these homegrown qualification approaches have significant disadvantages: Employees mostly learn from their senior colleagues and, therewith, merely knowledge and skills that are part of current work practices. We argue that novel advisory approaches comprising novel skills can hardly be transmitted this way. Furthermore, the differing didactic capabilities of these "teachers" as well as their varying work experiences and educational backgrounds can strongly affect knowledge exchange. Ultimately, the resulting competences of employees can vary greatly.

A number of researchers have emphasized the importance of providing employees, especially in knowledge-intensive jobs – like advisory services – with suitable and effective learning opportunities (Billett, 2004; Ellström, 2001; Skule, 2004; Young, 2003). To integrate learning and work, organizations need to provide suitable learning resources to increase opportunities for learning and competence development at work (Ellström, 2001; Skule, 2004). In this context, applying suitably designed IT has much potential to help transforming employees' work environments into learning

environments (Billett, 2004). However, organizations frequently miss to unfold novel IT means to increase efficiency and productivity, for instance by improving data access or information quality, aiming for increased efficiency and productivity (Danziger and Andersen, 2002). Young (2003) argue that IT should be used as "cognitive tools and constructivist environments" where employees can learn and enhance their work-related skills. Whereas these researchers emphasize the necessity of providing effective learning opportunities at work and highlight the benefits, they rarely discuss how organizations can provide their employees with suitable on-the-job learning opportunities through which they can transform their workplaces into actual learning environments.

As measures to systematically develop skills in the workplace, current research literature mostly offers and discusses experience-based approaches (also referred to as *experiential learning*) (e.g., Andresen et al., 2000; Kolb, 1984). These are well suited to facilitate the transfer of tacit knowledge, and are therefore broadly used in work contexts (cf. Engelström, 1987; Eraut, 2007; Guile and Griffiths, 2001; Hansen et al., 1999; Smith, 2001). Hansen et al. (1999) as well as Smith (2001), have shown, for instance, how employees use "hands-on" measures to convey their tacit knowledge. In his study, Eraut (2007) provides a comprehensive analysis of current on-the-job qualification measures, focusing on explicit as well as tacit knowledge transfer between peers. In line with these research findings, experiential learning constitutes a suitable method to qualify service personnel. Kolb pointed out that "knowledge results from a combination of grasping and transforming experience." (Kolb, 1984, p. 41). In his experiential learning concept, learners need to go through a distinct learning cycle of four steps to acquire new knowledge and skills. They should: 1) be enabled to actively experiment, 2) make concrete experiences, 3) reflect on these experiences, and 4) abstract and conceptualize new knowledge. Accordingly, this experiential learning cycle needs to be initiated at some point in on-the-job qualification efforts. We use the experiential learning cycle from Kolb (Kolb, 1984), since it is widely used in multiple studies that investigate learning in

the workplace (e.g. Guile and Griffiths, 2001; Marsick and Watkins, 2001; Sheehan and Kearns, 1995). Other experience-based learning approaches with similar learning cycles – for instance, expansive learning (Engelström, 1987) – may also be possible approaches.

In this paper, we introduce a novel approach for on-the-job qualification, using affordances to initiate experiential learning episodes. *Affordances* describe the action possibilities provided by an artifact's characteristics to its users that emerge at the time of interaction (Gibson, 1977; Jones, 2003; Stoffregen, 2003), for instance, when using a jug, a handle suggests to a user to lift it rather than push it. Hence, affordances suggest to users to follow certain behaviors or modes of usage. Even more, users are able to directly perceive an artifact's affordance without additional cognitive effort (Fayard and Weeks, 2007; Zillien, 2008). In the context of IT-supported learning, different researchers have shown that corresponding artifacts have large potential to function as instructional systems, engaging learners in critical thinking and thus promote learning (Jonassen, 1999; Jonassen et al., 1998; Young, 2003). Thus, we argue that when integrating artifacts that provide educational affordances in an employee's work environment, they have the potential to help start experiential learning cycles. The useful properties of affordances to guide individuals in their learning behaviors are also described by a number of researchers who have investigated affordances in various educational contexts, e.g. classrooms, game environments, outdoor activities, or self-directed learning. They have identified learning affordances for particular technologies, for instance, 3-D virtual environments (Dalgarno and Lee, 2010), PDAs (Churchill and Churchill, 2008; Lai et al., 2007), or blogs (Robertson, 2011). Dalgarno and Lee (2010), for instance, describe the technology's use to "facilitate experiential learning tasks that would be impractical or impossible to undertake in the real world" (Dalgarno and Lee, 2010, p. 19), fostering intrinsic motivation and engagement. Other researchers have analyzed the fundamental relationship between affordances and learning technology (e.g., Bower, 2008; Kirschner, 2002). For instance, Bower (2008) provides a comprehensive list of affordances that technologies should possess to help create learning experiences, e.g. media,

spatial, temporal, synthesis, or access-control affordances. However, current research rarely provides insights on design and application of educational affordances in the context of on-the-job learning, especially work environments of front office employees, where in addition to learning new knowledge and skills, i) learners should perform in their jobs, and ii) where non-learners (i.e. clients) are concurrently present. Accordingly, current approaches rarely address the work environment as learning context, and thereby do not account for its influences on learners and their learning behaviors. As Kirschner et al. emphasized (2004), the social context could significantly influence learner behavior.

Thus, in this paper, we seek to bridge the identified research gaps in on-the-job qualification. We present a novel on-the job qualification approach, blending affordances into experiential learning, and show how service personnel could effectively be qualified on-the-job to become skilled advisors. In this approach, we integrate an IT artifact, containing appropriately designed affordances, into service personnel's daily work practices.

## 3.3 Research design

To answer our working hypothesis, we followed a design science research approach as proposed by Peffers et al. (2007) consisting of six activities that should be followed when conducting a design science research project: 1) defining and justifying the research problem, 2) defining the objectives for a solution, 3) designing and developing the artifact, 4) demonstrating the artifact's use, 5) evaluating the artifact, and 6) communicating the results. The design science approach is well suited to solve such "wicked design problems", characterized by changing requirements, an ill-defined environment, and a dependence upon human cognitive abilities (Hevner et al., 2004). "Design is essentially a search process to discover an effective solution to a problem" (Hevner et al., 2004, p. 88); in this context, we report from two design-and-evaluate cycles to present an effective on-the-job

qualification approach, using affordances to initiate experiential learning episodes. In the paper, we address Peffers et al.'s (2007) six activities in the following parts:

***Problem specification*** *(addressing activities 1 and 2)*
We present the case of face-to-face citizens' advisory services conducted by front office employees in public administrations to highlight the problem and its relevance (Section 3.4). We analyzed front office employees' current work practices, identified their most critical advisory-related deficiencies, and formulated specific solution objectives that IT artifacts that help employees qualify on-the-job should accomplish. In doing so, the insights are based on prior research publications of the authors. Therein, front office employees' advisory-related work practices are collected using mystery shopping in today's public administrations' front offices as well as interviews with employees.

***First design-and-evaluate cycle*** *(addressing activities 3, 4, and 5)*

FIRST ITERATION'S DESIGN: Using our insights on the skills front office employees need and the skills they lack, we describe how IT artifacts can be equipped with *facilitation affordances* in order to help employees develop the identified lacking facilitation skills (Section 3.5): Based on current research literature on facilitation and on user interface design, we derived design principles that describe how these artifacts should be designed, i.e. to equip them with facilitation affordances. Furthermore, we show how these artifacts could be instantiated in an IT system that supports front office employees and clients in their face-to-face advisory sessions.

FIRST ITERATION'S EVALUATION: We conducted an evaluation with six front office employees from the public administration of Mannheim and 12 clients to show how *learning with facilitation affordances* could effectively support front office employees to develop their facilitation skills on-the-job. We present the details of the evaluation in Section 3.6.

***Second design-and-evaluate cycle*** *(addressing activities 3, 4, and 5)*

SECOND ITERATION'S DESIGN: Based on the insights from the first design-and-evaluate cycle, specifically the discovered deficiencies, we refined existing and develop additional design principles (Section 3.7). In doing so, we present a complemented set of *counseling affordances* to show how to provide the all-encompassing support that front office employees need to become and act as skilled advisors on-the-job.

SECOND ITERATION'S EVALUATION: We conducted a second evaluation with 12 front office employees from the public administration of Mannheim and 36 clients to show how "learning with counseling affordances" could effectively empower front office employees on-the-job to become and act as skilled advisors. We provide the details of the evaluation setting, data collection, and results in Section 3.8.

***Discussion and conclusion*** *(addressing activity 6)*

We discuss our findings from the two design-an-evaluate cycles, present the "learning with counseling affordances"-approach, and highlight implications for research and practice (cf. section 3.9).

Figure 3.3-1 depicts our study's research approach following a design science research methodology with the individual research activities and applied methods to develop the "learning with counseling affordances"-approach and answer our working hypothesis.

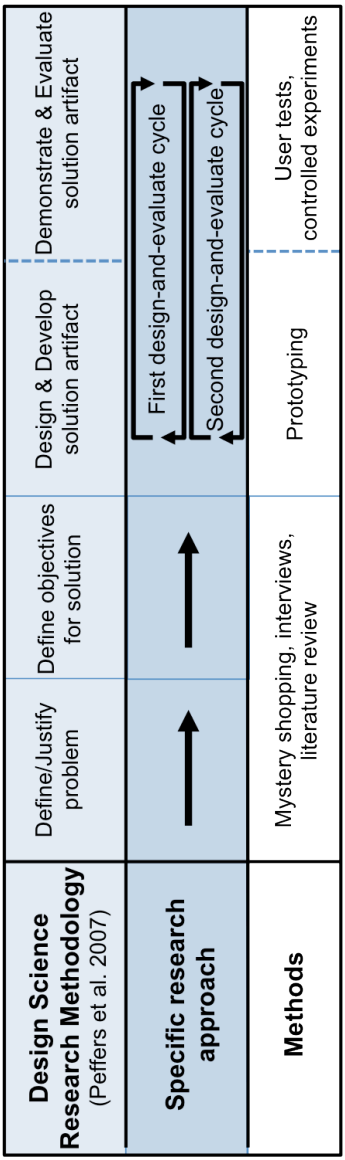


**Figure 3.3-1: The research design following a design science research methodology**

## 3.4 Problem Specification: The Case of Citizen Advisory Services

Citizens nowadays increasingly perceive themselves more as customers rather than petitioners of public administrations. Accordingly, their expectations of service quality rise when seeking advice in public administrations' front offices (Accenture, 2005; J. E. Fountain, 2001; Schedler and Proeller, 2000). In current research literature, it is recognized that front office employees lack the necessary skills to provide desired customer service levels (cf. Andersen, 2006; Bretscher, 2009; Giesbrecht et al., 2011; Hielscher and Ochs, 2009; Schwabe, 2011). In this context, a number of researchers have described the goals citizen services should accomplish and highlight skills that modern public administration employees should have in order to perform these services (cf. Denhardt and Denhardt, 2000; Hummel and Krcmar, 2003; Leitner, 2006; Schuppan, 2010; Schwabe, 2011). However, they barely discuss how front office employees could actually develop these skills.

In the following paragraphs we highlight the facilitation-related deficiencies that today's front office employees in public administrations show, when giving advice to clients, i.e. citizens. Furthermore, we derive specific solution objectives that should be achieved when developing corresponding qualification measure. We separate our findings into "process design"-related and "social interaction"-related findings, as these cover the relevant areas where advisors should master the skills to perform sound advisory service (cf. Section 3.2.1). We build our findings on prior research publications from the authors on the current work practices of front office employees in public administrations, especially Giesbrecht et al. (2011) as well as Schwabe et al. (2010a, 2010c). The following subsections summarize the insights from these research studies, with an emphasis on Giesbrecht et al. (2011). In these studies, data and insights were gathered in a series of mystery shopping episodes in public administrations' front offices and in interviews with front office employees.

### *3.4.1 "Process design"-related deficiencies*

In their face-to-face advisory encounters, today's front office administrators restrict themselves to superficial information provision. That is, rather impersonal processing of transactions with hardly any structured advisory process. They do not define clear objectives for the advisory collaboration with the clients, imped the creation of a conversation structure and miss the opportunity to lead citizens through the advisory sessions. As a result, administrators switch unpredictably during their advisory sessions between exploring citizens' needs and seeking suitable solutions. They let clients lead conversations and only answer their direct questions. Front office administrators show little – if any – proactive behavior. They sometimes even opportunistically shorten the advisory process by restricting the advisory session to answering just one or two questions of the citizens and then close the conversation.

*Applying tools to support process design:* In their current practice, front office administrators make very little use of available tools – analog or digital – to support their activities during advisory sessions with clients. Their usage is limited either to searching for and handing over standardized forms or brochures, or to accessing information from an electronic register via their desktop computer and verbally handing the information over. In doing so, the front office administrators in their tool usage behavior withdraw from clients and exclude them from their actions. The applied tools thus become more of an information barrier (Rodden et al., 2003), thereby hampering creating process transparency (Nussbaumer et al., 2012).

This raises the question how to get front office administrators to establish a distinct problem-solving process during their advisory sessions. Thus, we formulate a first solution objective that an adequate qualification approach should *enable advisors to establish a more structured and proactive advisory process* (**SO1**).

### *3.4.2 "Social interaction"-related deficiencies*

From the perspective of a skilled advisor, front office employees establish poor relationships with their clients: Interactions are restricted to receiving a client's concrete requests, for instance, "I want to register!", and to delivering solution information verbally or via standardized documents. They do not create a participative environment, which is needed to establish a client-centered, personalized service. These findings have also been described by Hielscher and Ochs, who showed (2009) that, of 41 observed advisory sessions, only two were conducted in the desired "co-productive" manner, and only 17 where of a "supporting, client-centered" interaction-type.

*Applying tools to support social interaction:* The way front office employees today use available tools and information resources can hamper establishing close social bonds: When using information resources such as forms, brochures, or their desktop computer, front office employees withdraw from clients, focusing solely on the respective information resource without integrating the clients in their actions, and only "returned" to the clients to handing found information over. Thereby, available tools and information resources tend to become communication barriers between advisors and clients. Accordingly, front office employees' current tool usage behavior can increase information asymmetry between them and clients, which can severely hamper establishing an active dialog and a collaborative work environment (Prahalad and Ramaswamy, 2004a).

This raises the question how to get front office employees to establish close relationships with advice-seeking citizens, integrating them as equal co-creators. Thus, we formulate a third solution objective: *to enable advisors to establish an open, participative work environment during advisory encounters with client* (**SO2**).

## 3.5 First Iteration: Designing Facilitation Affordances

Front office employees' current work practices reveal their deficiencies concerning extending administrator-like behavior into becoming actual facilitators of the advisory service encounters. We argue that they need suitable support to help them comply with their role-related tasks. Therefore, in line with our working hypothesis, we describe how front office employees can be provided with appropriately designed *facilitation affordances*, allowing them to experience new advice-giving work practices on-the-job, thereby initiating experiential learning episodes and helping them to become and act as skilled advisors. In the following paragraphs, we describe how corresponding artifacts should be designed by developing four generic design principles that represent the basic concepts for equipping IT artifacts with facilitation affordances. We refer to the resulting artifacts as *facilitation artifacts*.

The duties and responsibilities of facilitators are well discussed in research literature (cf. Bostrom et al., 1993; Briggs et al., 2009; Briggs and de Vreede, 2011; Clawson et al., 1993; Hayne, 1999; Kolfschoten et al., 2006; Schwabe, 1995). In their studies, Bostrom et al. (1993), Clawson et al. (1993), and Schwabe (1995) explicated the individual tasks that facilitators should perform. Briggs et al. (2009) introduced a seven-layer model for collaboration that can be used to guide facilitator in establishing fruitful group work. Kolfschoten et al. (2006) summarized high-value recurring collabor*a*tive tasks in their *ThinkLets* concept, providing designated facilitators with best practice collaboration patterns. In the following paragraphs, based on our analysis of the current research literature on facilitation, we develop five generic design principles that IT artifacts should be built on to support front office administrators to become skilled advisors. Additionally, we describe how these design principles can be implemented in an IT artifact that supports advisors and citizens in their face-to-face advisory sessions.

**Design principle 1** ***"establish a shared information space" (DP 1)*** to afford establishing an open and participative work environment

In their role as facilitators, advisors should use activities, technology, and their communication skills to get the clients involved from the very beginning in co-creating the advisory session's outcome (Bostrom et al., 1993). In this context, we propose supporting advisors in their corresponding tasks by *establishing a shared information space* in which advisors and clients have equal possibilities to monitor, access, and edit all tools and information resources. A corresponding shared information space helps advisors and clients to establish a common ground of their shared knowledge and beliefs, helping them to facilitate communication and cooperation (Carroll et al., 2006). A shared information space can help reduce information asymmetries between the actors, which – according to Prahalad and Ramaswamy (2004a) – hinder fruitful dialog between actors. In their studies, Nussbaumer et al. (2012) or Inbar and Tractinsky (2012) showed that establishing a shared information space can increase information transparency in the service encounter, helping advisors and clients to monitor and comprehend each others' actions and intervene if necessary (addressing SO1). The shared information resources that both advisors and clients can refer to and make sense of can promote joint exploration and planning (Rodden et al., 2003). Therefore, establishing a shared information space can encourage advisors and clients to intensify their collaboration and their mutual information exchange in an open, participative work environment (addressing SO2).

***Implementation:*** To establish and enforce a shared information space throughout the advisory session, we used a 20-inch touchscreen device (Sony Vaio Tap 20) as physical medium of the *CitizenExplorer*. Furthermore, we positioned advisors and clients in a 90° to 135° degree angle in front of the device, as depicted in Figure 3.5-1. Within this physical setting, all participants could monitor the screen and were also enabled to interact with the artifact. Ultimately, a physically established shared information space

should encourage advisors to create an open, participative work environment, actively including clients in all problem-solving activities.

**Figure 3.5-1: Physical setup in an advisory session supported by the CitizenExplorer as facilitation artifact (left: client; right: advisor)**

**Design principle 2 "provide problem-solving spaces" *(DP 2)*** to afford creating a structured problem-solving process

In their role as facilitators, advisors need to ensure that an advisory session's outcome will be established (Bostrom et al., 1993). They therefore need to establish and actively direct a structured advisory process (Clawson et al., 1993). Advisors should choose appropriate problem-solving activities and should guide their clients through them. To support and encourage advisors to comply with these tasks, we propose building the IT artifact on *problem-solving spaces*: For each phase of the problem-solving process, one space is provided. Advisors and clients always work in one space that encapsulates all information resources and tools necessary to carry out the corresponding problem-solving activity. The spaces must not overlap with each other, so as to help advisors concentrating on one distinct process phase. Within a space, advisors can use the entire inventory, i.e. tools and information resources, to adapt the individual problem-solving activity to a client's needs. The room

metaphor is well known in CSCW design to facilitate and structure interactions (cf. Harrison and Dourish, 1996; Henderson Jr and Card, 1986; Schwabe and Krcmar, 2000). Providing different "rooms" or "spaces" can help to separate different collaborative activities and to provide different work contexts, e.g. divergent needs elicitation vs. convergent solution-finding (Schwabe and Krcmar, 2000). In this context, distributing the individual problem-solving activities on different "spaces" can foster process transparency (Nussbaumer et al., 2012), i.e. the advisors' and clients' perceptions of understanding *how* and *why* actions are performed. Improving process transparency can help advisors to strengthen their control of the advisory process, as they could better understand the goals of the individual problem-solving activities and can better visualize the process (Grote et al., 2000).

***Implementation:*** To implement the "spaces"-metaphor, we created separated screens to represent the individual advisory phases: problem elicitation and solution-finding. Each screen contains all tools and information sources needed to complete the respective phase. On the problem elicitation screen (cf. Figure 3.5-2, upper left), users can create individual memo cards to externalize a client's problems and have access to a database of frequently discussed problem topics through a large tag cloud (cf. Figure 3.5-2 upper left; the yellow memo card and the with cloud). On the solution-finding screen (cf. Figure 3.5-2, upper right as well as lower left and right), users can switch between the presentations of three different solution information sources: pressing the watch icon on the left shows time-related solution information (Figure 3.5-2, upper right), pressing the map icon shows location-related solution information (Figure 3.5-2, lower left), and pressing the document icon shows forms, digital leaflets, or websites containing solution information (Figure 3.5-2, lower right). The transition from problem elicitation to solution finding screens was implemented with the magnifier icon on the individual memo cards: pressing this icon opens the solution-finding screen. And pressing the magnifier icon on the memo

card again (now it is visible in the upper middle of the screen) minimizes the solution-finding screen for the particular memo card.

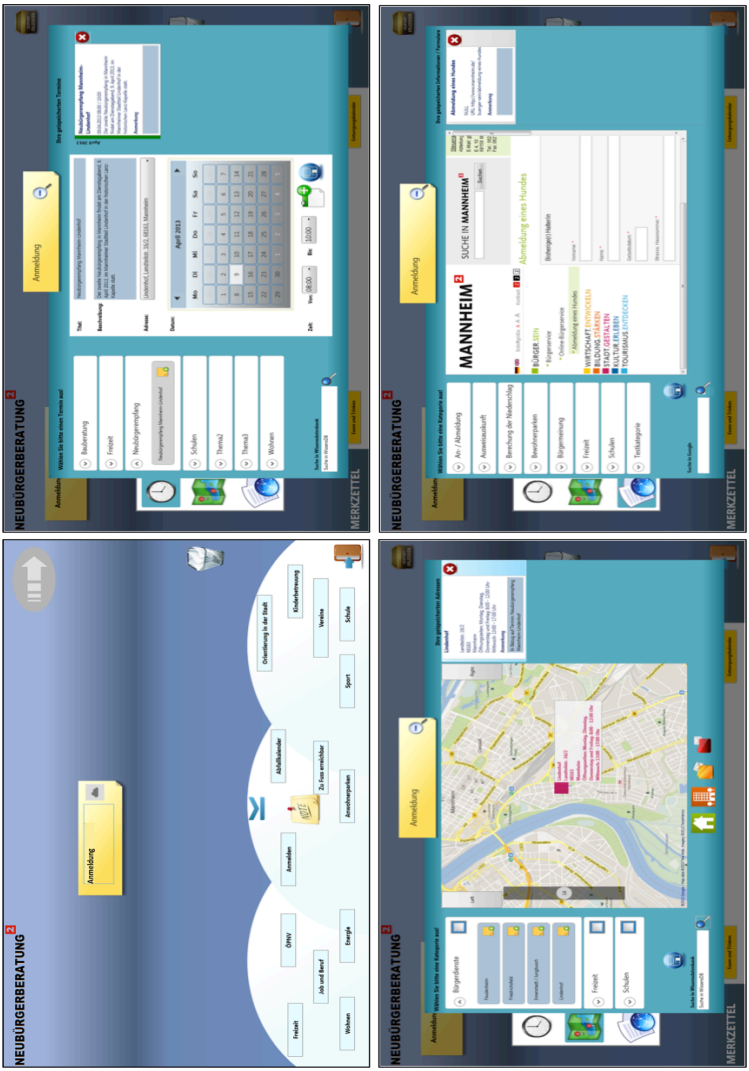


**Figure 3.5-2: The problem elicitation screen (lower left) and the solution finding screens with its sub-screens: time-related (upper left), location-related (lower right), and activity-related (upper right) governmental information**

**Design principle 3 "offer collaboration material and corresponding tools by using well-known metaphors" (DP 3)** to afford intuitive integration of tools and information resources:

In their role as facilitators, the advisors should become *process guides* (Briggs and de Vreede, 2011) and actively influence the advisory encounter towards the initially defined outcome (Clawson et al., 1993). Therefore, to support individual problem-solving activities, they should appropriately integrate available tools and information resources into the advisor-client collaboration (ibid.). In doing so, advisors should ensure that the tools they apply do not become information or communication barriers between them and the clients (Rodden et al., 2003). They need to know how to appropriately apply tools to structure information (e.g. when exploring a client's problems), or to improve the information quality (e.g. when searching for solutions) (Briggs et al., 2009; Clawson et al., 1993). Thus, they should introduce appropriate collaboration material and edit it together with their clients to establish effective collaboration (Shrage, 1992). Collaboration material comprises information (e.g. text documents or pictures) and collaboration tools (e.g. mindmaps or discussion tools) that all participants can use. It is important to enable advisors and clients, despite their differing tool usage experiences and educational backgrounds, to make intuitive use of the collaboration material, to help reducing information asymmetry, with its negative effects on advisor-client relationship (Prahalad and Ramaswamy, 2004a). To this end, we propose using well-known metaphors when providing collaboration material. In the context of user interface design, metaphors allow users to apply knowledge from more familiar areas to understand a user interface component's function, for instance, the "desktop" metaphor (Harrison and Dourish, 1996; Henderson Jr and Card, 1986), thereby helping to lower usage barriers. Using metaphors can encourage users to operate an available tool or information resource as desired, for instance, displaying Post-it labels combined with an empty area to encourage users to start collecting ideas. Therefore, we argue that IT artifacts that provide facilitation affordances should *offer collaboration material and corresponding tools by using well-known metaphors* to afford intuitive

integration of tools and information resources into advisor-client interactions.

***Implementation***: Within the problem elicitation phase, we provide the users with a "memo card"- as well as a "tag cloud"-metaphor (cf. Figure 3.5-2, upper left) to engage them in the collaboration pattern "generate" (Briggs et al., 2009). Furthermore, we provided distinct "empty areas" to stimulate advisors and clients to think about problems and needs (cf. Figure 3.5-2 upper left; the blue area on the problem elicitation screen). In the solution-finding phase, users should be directed to reduce the solution information towards the most suitable one. Therefore, we applied a "list"-metaphor to enable users to browse through available solution information and provide a detailed view, like a geographical map, to help "clarify" an individual solution (cf. Figure 3.5-2, in the middle of the three subscreens of the solution-finding screen).

**Design principle 4 "enwrap existing tools and information resources" (DP 4)** to afford seeing traditional tools in the context of collaborative work practices

In their role as facilitator, advisors should know the available tools and information resources – both analog (e.g. public school application form) and digital (e.g. electronic population register) and should appropriately integrate them into the advisory sessions with clients (Clawson et al., 1993). In this context, advisors' current work practices of using tools and information resources predominantly on their own, without integrating clients into their actions, can promote information asymmetry between them and clients (Nussbaumer et al., 2012), and, understandably, leads to the applied tools and information resources becoming communication barriers rather then communication supports (Rodden et al., 2003). Therefore, we argue that advisors should be supported in getting acquainted with the available tools and information resources and experience their application within the collaborative work practices of advisory encounters. Therefore, we propose that an IT artifact that provides facilitation affordances should

*enwrap existing tools and information resources* and thus include them in advisor-client collaborations. Therewith, advisors should be encouraged to discover novel, collaborative usage types, e.g., provide information to help structure collaboration or to externalize information of individual problem-solving activities.

***Implementation***: We embedded information resources such as an internal knowledge database or the city's official websites in the spaces where they are needed, and provided a visualization to match the activity in the corresponding space. The internal knowledge database's information, which was useful in the problem elicitation phase, was visualized by using a "tag cloud"-metaphor. Thus, advisors and clients could explore the content of the database without explicitly accessing the database (cf. Figure 3.5-2, upper left). Furthermore, we embedded available information resources and editing tools into the solution-finding phase by providing an appropriately designed search interface (cf. Figure 3.5-2, upper right and lower left/right) so that users could browse through the information sources with their different information types: time-related (e.g. opening hours), location-related (e.g. addresses), activity-related (e.g. digital forms or online services). Therefore, users are provided with a suitable visualization of details, for instance a calendar, map, or a document/website viewer.

## 3.6 The Evaluation of the First Iteration

To evaluate whether our novel qualification measure enables front office employees to effectively develop their counseling skills, we conducted a test with real-world users.

### *3.6.1 Evaluation design*

Six front office employees from the German city of Mannheim conducted 24 advisory sessions. The five female and one male advisor were between 20 and 57 years old (average: 32.7) and have accordant work experiences as public administrators (between 2 and 38 years). To assess the changes in the advisors' advice-giving behavior, the test was conducted in a within-subject

design. Concretely, the advisors first conducted one conventional advisory session at their normal workplace, then they conducted two artifact-supported advisory sessions, and then one conventional advisory session. Therefore, 12 "new-in-town"-citizens were recruited from the city's population. The six female and six male clients were between 18 and 74 years old (average: 39.5) with different educational and social backgrounds. It was assured that, first, an advisor gave advice to four different clients and, second, that each client experienced a conventional and an artifact-supported advisory session. Furthermore, the clients received the two different treatments in alternating order, so that, six clients started with the conventional and six started with the artifact-supported session. The only instruction the advisors received was a 40-minute technical introduction to the *CitizenExplorer*. Therein, no advice-giving behaviors were communicated. Each advisory session lasted about 25 minutes, in which there was no significant difference between the conventional and the artifact-supported sessions.

We video-recorded all 24 advisory sessions and analyzed them to identify objective changes in the advisors' behavior by comparing the conventional and the artifact-supported sessions. Furthermore, advisors and clients were asked to give their subjective feedback and to evaluate the given/received advisory sessions by means of a questionnaire and in a semi-structured interview. The questionnaire items were based on the intrinsic motivation inventory (IMI) measuring tool (Deci and Ryan, 2003). Participants rated statements on a 7-point Likert scale regarding their *perceived competence*, e.g. "I am satisfied with my performance within the given advisory session", their *perceived autonomy*, e.g. "I believed I had some choice to adapt the advisory process to my preferences", and their *perceived relatedness*, e.g. "During the advisory session, I felt close to the client" (the clients' items were rephrased accordingly). Furthermore, we assessed participants' satisfaction of the provided/received advisory service (Yield Shift Theory; (Briggs et al., 2012). Finally, we complemented the questionnaire with additional question items to deepen our understanding on the different

types of advisors' competencies (professional, methodical, social, and personal competencies (Erpenbeck and von Rosenstiel, 2007). While the above items covered the professional, the social, and part of the methodical skills, the additional items assessed the advisors' media skills (their knowledge and methodical ability to operate available media), their systematic-methodical skills to guide clients though a structured process, and their systematic-methodical skills to comprehensibly provide information. The interview question catalog comprised the same categories as the questionnaire in order to learn about the rationales behind participant behaviors in the advisory sessions and their questionnaire answers.

### *3.6.2 Results*

All six advisors showed in their artifact-supported advisory sessions, i.e. when "working with the facilitation affordances", compared to their conventional advisory sessions, substantial changes in their advisory behaviors towards achieving the solution objectives (SO1, SO2). However, the evaluation also revealed specific deficiencies, indicating that front office employees are not yet sufficiently capable of providing comprehensive, sound advisory services, i.e. that the facilitation affordances do not yet provide the all-encompassing support that front office employees need. In detail, the users' overall satisfaction with the artifact-supported advisory sessions was not rated higher than in the conventional advisory sessions, neither by clients (on average, 5.62 in artifact-supported and 5.60 in the conventional sessions) nor by advisors (on average, 5.1 in the artifact-supported and 4.9 in the conventional sessions). Thus, we report on the evaluation's results, highlighting how the solution objectives were met and what deficiencies and challenges occurred that could help explain the invariant satisfaction.

#### *3.6.2.1 Applying "process design"-related skills (addressing SO1)*

***General results***: All six advisors in the conventional advisory sessions showed their "standard" behavior of reactively answering clients' questions, with no actual structuring of the advisory process. Yet, in the artifact-

supported advisory sessions, four of the six advisors established a more distinct problem elicitation phase, bringing their and the clients' focus onto the needs elicitation screen (DP 2). They began to proactively ask deepening questions (on average, the advisors asked four questions in the artifact-supported sessions, whereas they only asked two questions in the conventional sessions). The clients confirmed our observations of the advisors' changed behaviors: In the interviews, nine of the 12 clients described the needs elicitation in the artifact-supported session as more comprehensive. In the solution-finding phase, instead of their former one-way communication, five of six advisors began to guide the clients through the different information sources, enwrapped in the *CitizenExplorer* (DP 5) and discussed with clients different solution possibilities regarding their usefulness. In this context, the clients valued the advisors' capability to customize the advisory process in the artifact-supported advisory sessions slightly higher than in the conventional ones (4.8 in the conventional and 5.1 in the artifact-supported sessions). The advisors provided reasons for their behavior referring to the more efficient collaboration. One advisor stated: "We [advisor and client] could establish a shared understanding of the client's problems much quicker." (all quotes were translated to English by the authors). Another advisor summarized: "I could explain the facts more easily to the clients […] they understood them faster."

***Applying tools to support process design***: In contrast to their low tool usage in the conventional advisor sessions, all six advisors started to intensively integrate the tools and information resources enwrapped in the *CitizenExplorer*'s individual problem-solving screens (DP5) into the verbal discussions with the clients. They used the tag cloud to enrich and deepen the problem discussions in the needs elicitation phase or used the web browser and the map visualization to provide more elaborate explanations of solution information. Correspondingly, 10 out of 12 clients made similar statements, describing the artifact-supported advisory sessions as more comprehensive on the informational level.

***Occurring deficiency: "Non-transparent transition between problem-solving spaces"***: In their role as facilitator, advisors were expected to appropriately moderate all activities to keep the clients integrated as active co-creators (addressing SO2) at all times and to guide them through a structured problem-solving process (addressing SO1). And actually, the advisors showed in the artifact-supported sessions considerably more active process guidance in the individual problem-solving phases. However, when switching between the problem-solving spaces (DP2), five of six advisors always abruptly changed from needs elicitation activities to solution-finding activities without explaining their actions to the clients. Video analysis of these transition episodes in the artifact-supported sessions revealed that the advisors were in fact strongly occupied with the tool, concretely in switching to the solution-finding screen and orienting themselves before resuming dialog with the clients. One advisor noted: "I again had difficulties to orient myself when we switched to the solution screen." The advisors' inadequate behavior also affected the clients and their behavior: The clients could not see any difference between the conventional and the artifact-supported advisory sessions concerning the advisors' ability to provide them with information more comprehensibly (5.1 in the artifact-supported and 5 in the conventional sessions). Furthermore, when the advisors switched to the solution-finding phase, clients struggled noticeably to follow the advisors' actions and, as a result, became passive consumers rather than active co-creators. In the interviews, six of the 12 clients made similar statements about struggling to follow an advisor's explanation or losing their orientation in the solution discussions. One client summarized: " […] but then [after the needs elicitation] I struggled to follow the advisors' explanations." Another client described: "I lost orientation about which issues we had already discussed." In this context, the clients did not perceive the artifact-supported sessions as better structured than the conventional ones (4.8 in both artifact-supported and conventional advisory sessions).

#### *3.6.2.2 Applying "social interaction"-related skills (addressing SO2)*

***General results***: In the conventional advisory sessions, the advisors did only establish a distant relationship to clients; they only interacted with them at the start of the session, to collect the clients' requests, and again at the end, to hand over the solution. In between, they withdrew to search for solutions on their own and excluded clients from their actions. Yet, in the artifact-supported sessions, five of six advisors extended their problem discussions with the clients substantially by asking additional deepening questions (on average, four questions in the artifact-supported sessions and only two questions in the conventional sessions) and using the *CitizenExplorer*'s tag cloud feature to bring in further relevant issues or problems. This indicates a more collaborative work environment (addressing SO2). The advisors confirmed our findings: Four of six advisors made similar statements in the interviews that collaboratively developing solutions with clients would be the most significant added value in the artifact-supported advisory sessions. In this context, the clients supported the advisors' statements and valued their perceived relatedness in the artifact-supported sessions higher than in the conventional sessions (on average, 5.7 in the artifact-supported sessions, but only 5.1 in the conventional sessions).

***Applying tools to support social interaction***: Within the physically established shared information space (DP1), the advisors established dialog with the clients more actively and began to intensify their mutual information exchange: Our observations revealed that five of six advisors used the available tools and information resources, e.g. the map displaying location-related solution information, as collaboration material (DP4) in their interactions with clients. In their interviews, the advisors highlighted the beneficial effect of their changed tool usage behaviors, of making the mutual information exchange much more efficient. One advisor summarized: "With actively integrating clients into the solution-finding, I could guide them better and be more responsive to their concerns […] therewith, they understood the solution much quicker."

***Occurring deficiency "exclusionary information search behavior"***: By "exclusionary information search behavior" we mean the self-involved, client-excluding behavior that all six advisors in our test revealed at some point in their advisory sessions. When the advisors started to use the enwrapped information resources (DP5) to gather solution information, they changed their behavior suddenly: From lively dialog with clients, they drew back, focused solely on the information resources and excluded the clients from their actions. Only after having found suitable solution information and preparing it for presentation, did they again begin to open up and include the clients into their actions. As a result, the structured problem-solving process collapsed and had to be reestablished. These behavioral changes were so strong that seven of 12 clients explicitly referred to them in the interviews. They described their perceptions of being excluded and described the advisor as "trapped in the tool" and "to act with no confidence when searching for information." Four of the six advisors also referred to these situations, mentioning feeling "insecure", "not confident" or "slightly overburdened" when searching for solution information. Furthermore, three advisors made similar statements of not being able to plan further solution discussions when they could not foresee what information the tool will provide. One advisor summarized: "When I don't know what sorts of solutions I will find, I cannot start discussing with the client.".

#### *3.6.2.3 Uncovering further lacking skill*

***Occurring "random information collection":*** In the needs elicitation phase of the artifact-supported advisory sessions, five of the six advisors showed similar non-advisor-like behavior when searching for, preparing, and integrating problem information into the verbal discussions with clients. Whenever advisors made use of the tag cloud feature (cf. Figure 3.5-2, upper left) to search for further problem information (DP4), they i) disconnected from the ongoing verbal discussions with clients and focused all their attention on the IT tool, and ii) often returned with problem information that did not suit the current discussion. Subsequent inquiry in the interviews revealed some underlying reasons. The advisors described their difficulties

to match a client's detailed request with the higher-level frequently asked topics in the tag cloud. Furthermore, they mentioned that when they saw other interesting topics, they directly pulled them out of the cloud to supplement the needs elicitation. In numbers, of the on average four issues collected in the needs elicitation phase of the artifact-supported sessions, one was directly verbally expressed by the client, one arose from the discussion between the actors, and two were added by the advisor without a corresponding discussion. As a result, the advisors' actions were rather incomprehensible to clients and hence did not contribute to a systematic, goal-oriented needs elicitation. In this context, seven of the 12 clients made similar statements about the advisors' behavior in the needs elicitation as "less structured" or "random". Even stronger, four of these seven clients explicitly expressed their concerns about the needs elicitation's completeness. One client expressed: "I'm not sure if we discussed all relevant issues in my situation." Another client noted: "The advisor did not assess my situation systematically." We could observe a similar behavior in the solution finding activities: The advisors' "exclusionary information search behavior" not only caused the advisor-client relationship to interrupt, but clients also had difficulties to follow the advisors' actions and to comprehend the information they provided. One client mentioned: "I couldn't follow the advisor's explanation […] when they presented solutions in the tool." Another client summarized: "I struggled to comprehend how the advisor found solutions […] I would have liked to know.".

***Additional design goal***: The front office employees' inconsistent behavior in the observed artifact-supported advisory sessions could indicate an increased cognitive workload when accessing, processing, and integrating domain knowledge into the problem-solving activities with clients. It highlights that the front office employees still lack some skills to provide comprehensive advisory services. The first evaluation highlighted the advisor duties that exceed facilitators' tasks: In addition to moderating the advisory process and guiding the client through individual problem-solving activities, the front office employees must act as co-creators, and thereby

advance the problem-solving process on the level of content. However, front office employees often lack the diversified domain knowledge to comply with these additional tasks. Providing comprehensive advisory service to clients constitute an enlargement of their service catalog, previously consisting of mere processing the clients' requests. Yet, they are not prepared owing to a lack of organizational support, i.e. missing corresponding customized auxiliary means (cf. Lenk and Klee-Kruse, 2000; Schenk and Schwabe, 2011) or a lack of resources for the necessary training (Lenk and Schuppan, 2011). Ultimately we argue that the facilitation affordances did not provide the all-encompassing support that front office employees need to become and act as skilled advisors. The question arises: what does comprehensive support need to consist of to empower front office employees on-the-job to act as skilled advisors, successfully combining the behaviors of their dual role as co-creator and as facilitators in all situations in the advisory service encounter. Therefore, in addition to the two solution objectives for IT artifacts that provide facilitation affordances (described in Section 3.4), we complement and formulate a third solution objective: *to enable advisors to search for, process, prepare, and integrate external domain knowledge into their facilitator-related behavior within the advisory encounters with clients* (**SO3**).

## 3.7 Second iteration: from facilitation to counseling affordances

Based on our first evaluation's experiences, we argue that the concept of *facilitation affordances* should be extended to *counseling affordances*. These counseling affordances should help to empower front office administrators to become and act as skilled advisors who integrate expertise and domain knowledge from available information resources fluently and beneficially into their work behavior as facilitators. In the following paragraphs, we address the deficiencies that occurred in the first evaluation and derive additional design principles, which extend the previous set of design

principles for facilitation affordances, and show how they can be implemented to fulfill the extended set of solution objectives (SO1 to SO3).

### *3.7.1 From separated to connected problem-solving spaces*

The evaluation emphasized the advisors' difficulties to structure the advisory session in its totality beyond the individual problem-solving phases. In this context, the separated problem-solving spaces (DP2), adapted from the concept of physical rooms to help structuring (Harrison and Dourish, 1996), did not provide sufficient support regarding the transitions between the "rooms". In their role as facilitators, the advisors need to ensure that they and the clients could comprehend the individual steps in the problem-solving process (Clawson et al., 1993). To this end, switching from the needs elicitation phase to the solution-finding phase requires the advisors, not only to moderate the change in process activities, for instance, "Now, we are going to look for solutions". But in addition, they need to transfer the problem information, i.e. the elicited problems, comprehensibly into the subsequent problem-solving phase. Fostering a corresponding information transparency can help to diminish information asymmetry between advisors and clients and can thus help establish an active and fruitful dialog (Nussbaumer et al., 2012; Prahalad and Ramaswamy, 2004a). We argue that switching between problem-solving activities need to be supported more strongly than with separated problem-solving spaces. Thus, we refined the design principle *"provide problem-solving spaces"* and argue that supporting IT artifacts should ***"provide connected problem-solving spaces"*** (**revised DP2**), complementing the characteristics of the spaces concept (cf. Section 3.5) with a connecting element that the needs elicitation and the solution-finding spaces share as common component and that connects them on an informational level. Therewith, when implemented, the revised design principle should afford advisors to create a structured problem-solving process (addressing SO1).

***Implementation***: We implemented the concept of connected problem-solving spaces by introducing a *transition area* – a user interface element that

is shared by the provided problem-solving spaces, i.e. the needs elicitation screen and the solution-finding screen (cf. Figure 3.7-1). This transition area can be used to put in memo cards from the left and to put solution information on a memo card in the transition area from the right. To implement the transition area, the two screens were rearranged to be side-by-side with the transition area in the middle. To switch from the needs elicitation screen to the solution-finding screen, the transition action was changed from formerly (de)magnifying to a slide metaphor (DP3): A user can wipe the screens from left to right (and back), and the transition area always remain visible. Therewith, the transition area should i) help to externalize transition activities by filling the transition area with information (i.e. memo cards) before swiping, and ii) to facilitate process orientation by having the memo cards in the transition area constantly visible.

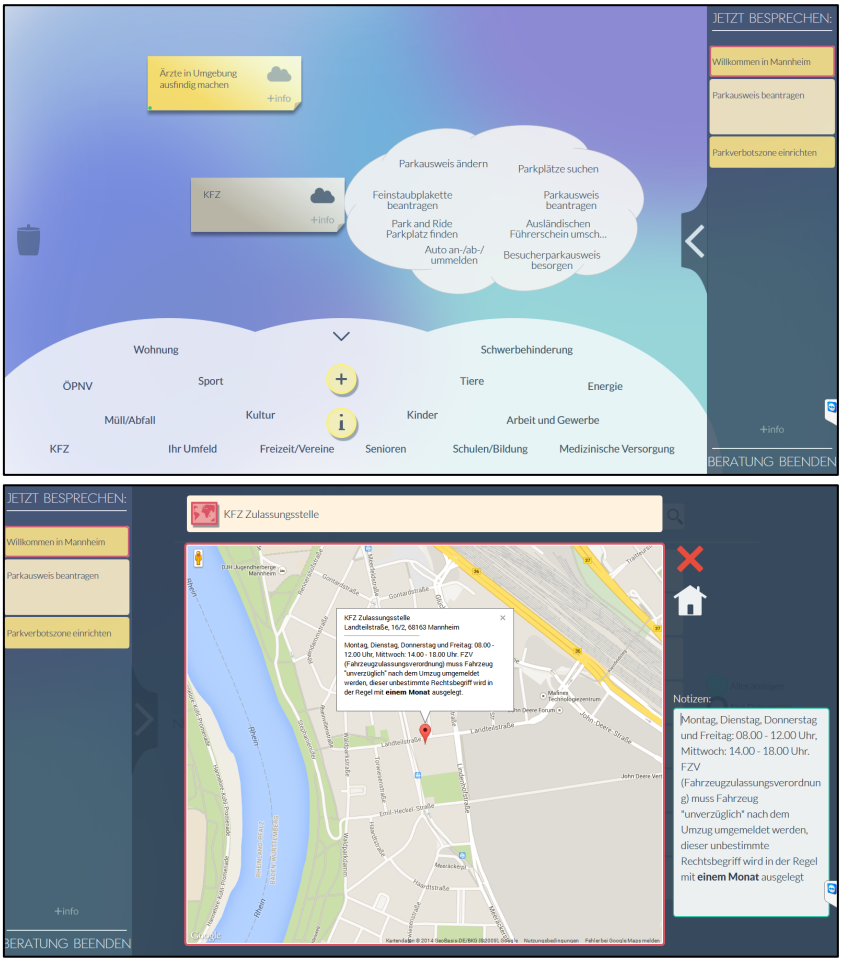


**Figure 3.7-1: Revised design of the *CitizenExplorer*: needs elicitation screen (above) and solution finding screen (below)**

### *3.7.2 From information on request to forward awareness information*

As the first evaluation emphasized, advisors often require information in advance regarding the enwrapped information sources, like e.g. information about the quality/fit of potential solutions, in order to structure and guide the solution discussions with clients. In this context, in the first iteration's design, corresponding information was only provided when the advisors explicitly requested them, i.e., when they selected a visualization tool in a problem-solving space, e.g. the geographical map on the solution-finding screen to see what possible solutions are available. As a result, the advisors interrupted their dialog with clients in order to manipulate the IT tool to gather information that help them to structure the solution discussion more purposefully (addressing SO1). In this context, we argue that advisors can benefit from being informed in advance on the "information resources' behavior", e.g. receiving information about the quality of a search query's results, proactively in order to support planning and guide the solution discussion with clients. As Cadiz et al. (2002) as well as Dourish and Bellotti (1992) point out in their work, having corresponding awareness information can enhance coordination and productivity of the collaborating actors. Corresponding awareness information should be provided peripheral to the actors' primary activity (Gutwin and Greenberg, 2001; Norman, 1993). Accordingly, gathering awareness information on the "things to come" should not increase the advisors' cognitive workload or distract them from their interpersonal communications with clients (addressing SO2). Therefore, we formulate the additional design principle that IT artifacts equipped with counseling affordances should "***provide forward awareness information***" (**DP7**) to afford advisors to sustain an open, participative work environment while working with external information sources.

***Implementation***: In the first iteration's design, advisors needed to perform multiple actions to find out about what types of solutions are available in terms of information quality or goodness of fit: They needed to switch to the solution-finding screen and open the visualizer of the enwrapped information resources, e.g. the geographical map or the web browser. In doing so, they risked looking at empty web browsers or empty maps when,

for instance, the problem statement was misspelt and no matching solution was found. This could cause them further stress and additionally increase their cognitive workload. In the revised design, we provided advisors with "forward awareness information" about the quality of the solutions. That is, in the discussions of the clients' problems, the advisors get provided with supporting information about the available solutions. To this end, we integrated a "*forward awareness traffic light*" feature on each memo card (cf. Figure 3.7-2): On each memo card, a colored dot was placed on the lower left corner, to notify users about the quality of the solutions that the system will suggest when switching to the solution-finding screen. The chosen grading was green for high, orange for medium, and red for low quality/fit of information. For example, "register your car" would have a green dot on the memo card (see Figure 3.7-2) as suitable forms for the car registration process are available. Thus, advisors could use the information from the *forward awareness traffic light* to more actively guide the conversation in desired directions, for instance, by re-discussing a specific issue if the color red appears. Furthermore, simple visualizations helped the advisors to quickly assess the information resources' state with minimal disruption of the relationship to the clients, as suggested by Maglio and Campell (2000) as well as Cadiz et al. (2002), allowing advisors to stay in their role as moderator of the problem-solving process.

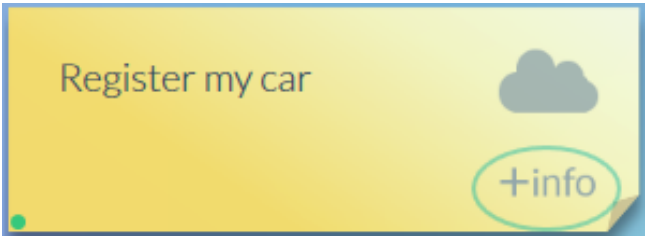


**Figure 3.7-2: The memo card "register my car" and the forward awareness information signaling a good quality/fit of available solutions (green dot in the lower left corner)**

### *3.7.3 From simple information provision to contextualized memory aid*

Working with domain knowledge from external information source (addressing SO3), e.g. the tag cloud with frequently discussed problem topics, strongly disturbed the advisors in their cognitive processes and significantly influenced their ability to guide clients through structured, systematic needs elicitations. In the physically established shared information space, the IT artifact with its enwrapped information sources represents an essential resource in the actors' shared cognitive processes (also known as distributed cognition; cf. (Blandford and Furniss, 2006; Hollan et al., 2000). Accordingly, external informational resources can or even should actively support the actors in their cognitive processes and should help them to cope with the cognitive workload, as Norman (1993) describes in the context of physically distributed cognition. In the context of the advisor-client collaboration, we therefore argue that available informational resources should not only provide kernel information, like e.g. the frequently discussed problem topics in the needs elicitation phase. But they should also provide further context information to help actors to integrate the kernel information into the dialog and their shared cognitive processes with the clients, like e.g. providing examples of specific problem statements when a problem topic is selected. Having corresponding contextualized memory aids can help preventing cognitive workload to increase by allowing actors to offload some of their cognitive duties (Hollan et al., 2000). The provision of contextualized memory aids rather than simple information provision should help advisors to overcome their difficulties to integrate additional knowledge from external information sources into the verbal discussions with clients (addressing SO3). Context information can provide advisors with additional memory cues (Stefanucci et al., 2007), which – in turn – can help them remember more related information, thus giving them additional thematic connection points for integrating new knowledge suitably and fluently into ongoing discussions. In doing so, the advisors can better signal their professional competence to clients, who constantly look for tangible signs of the employees' capability to give sound advice (Solomon et al., 1985). Therefore, we argue that IT artifacts equipped

with counseling affordances should "***provide contextualized memory aid***" (**DP8**) to afford advisors to integrate domain knowledge from external information resources fluently and beneficially into ongoing discussions with clients (addressing SO3).

***Implementation***: We implemented the concept of *contextualized memory aid* in the tag cloud feature, which so far provided advisors and clients in their needs elicitation activities with additional "problem space"-knowledge, specifically the names of the frequently discussed problem topics. In the second iteration's implementation, we complemented the tag cloud feature with additional related information. We added a second informational level that provides, for each problem topic, the top eight written-out problem statements that were discussed and searched solutions for in previous advisory sessions. For the two-level tag cloud's visualization, we introduced a second smaller cloud: Whenever a problem topic is selected, a memo card with the topic's name and a small cloud containing the top eight related problem statements appears in the middle of the empty space on the needs elicitation screen (cf. Figure 3.7-1). These additional problem statements provide advisors with slightly different perspectives on a problem topic, for instance, for the topic "children": "find a school for my child" pointing to school-related issues and "find a pediatrician close by" pointing to health-related issues. With providing additional context information instantaneously when the tag cloud is used should help advisors to find better and more suitable connecting points to integrate the knowledge fluently into current discussions with clients (addressing SO3). As Lin et al. claim (2004), memory aids should always be visible and instantly accessible for the users at all times. Accordingly, we assured that the tag cloud is constantly visible and accessible, in contrast to the first design, where the tag cloud could be minimized. Furthermore, by keeping the cloud metaphor and restricting the additional context information (the smaller cloud displays a maximum of eight information items), we wanted to maintain an intuitive and easy-to-use design in order to i) provide ease-to-access memory cues, and ii) to minimize additional cognitive workload for advisors.

## 3.8 Evaluation of the Second Prototype

Similar to the first design-and-evaluate cycle, we evaluated the revised *CitizenExplorer* prototype, equipped with counseling affordances, concerning the four solution objectives. Accordingly, we sought to show whether "learning with counseling affordances" could effectively empower front office employees on-the-job to become and act as skilled advisors, namely i.e. to establish a structured problem-solving process (SO1), to establish an open, participative work environment (SO2), and to search for, process, prepare, and integrate external domain knowledge into their facilitator-related behavior within advisory encounters with clients (SO3).

### *3.8.1 Evaluation design*

In the evaluation, 12 advisors advised 35 clients in 84 advisory sessions. The 12 advisors were actual front office employees from the public administration of Mannheim –same organization as in the first iteration, but not the same individuals. In order to have an analogous group of participating clients as in the first evaluation, i.e. "new-in-town"-citizens, clients were recruited among the usual clients of public administrations from cities different to the one we worked with. They could thus take on the role of new inhabitants more easily and have a similar (low) prior knowledge on city-specific administrative issues and processes. The nine female and three male advisors were between 19 and 57 years old (average: 31.3) and the 22 female and 14 male clients were between 18 and 56 years old (average: 27). The test was conducted in a within-subject design, i.e. each participant (advisor or client) experienced at least one conventional advisory session and one artifact-supported advisory session, to report directly on the perceived differences. Accordingly, the test was designed as follows: 1) the advisors received a refresh on the basic objectives of citizens' advisory services to ensure an equal state of basic knowledge, 2) each advisor conducted a conventional advisory session at their normal workplace as a baseline measurement (with an additional test client), 3) in a five-hour training, the advisors became acquainted with the *CitizenExplorer* artifact:

they received instructions how to handle the tool with its features, and then tried them out in a role play, 4) the advisors conducted three artifact-supported advisory sessions and three conventional advisory sessions, in alternating order. The clients experienced their one conventional and one artifact-supported advisory session in alternating order analog to the first evaluation.

### *3.8.2 Data collection*

Our test design allowed us to collect diversified data about advisors' (changing) advice-giving behaviors. First, all advisory sessions were recorded on video. These recordings were coded and analyzed by two researchers to identify the advisors' work behaviors regarding the three solution objectives. This comprised collecting the number of and the content of "process design"-related activities (e.g. proposing topics or asking questions to steer the discussion, giving explanations related to the advisory process, or applying auxiliary means to support the comprehensibility/transparency of the advisory process), as well as the number of and the content of "social interaction"-related activities (e.g. verbal invitations for participation, asking deepening questions to show empathy, or applying auxiliary means to promote equal access to information).

Second, semi-structured interviews were conducted with all participants, advisors and clients, to learn about the underlying reasons and motivations for their behavior during the different advisory sessions. The interview guidelines therefore consisted of questions related to the overall satisfaction, e.g. "With which advisory session were you more satisfied and why?", their "process design"-related activities, e.g. "Which advisory session was better structured and why?" or "Comparing the needs elicitation in the different advisory sessions, which was more structured? And why?", and their "social interaction"-related activities, e.g. "Which advisory sessions was more personal and more individual tailored to your needs? Why?" or "In which advisory sessions did you feel more included? Why?". The interview

questions were rephrased for the advisors as well as for the clients. The interviews lasted, on average, 35 minutes with clients and 45 minutes with advisors.

Third, advisors and clients provided quantitative feedback on their experiences in the different advisory sessions by answering a questionnaire. To supplement the observed (changed) work behaviors and participants' qualitative rationales, the questionnaire provides primarily data about the advisors' work-related skills, as perceived by the clients or self-assessed by the advisors. To deepen our understandings of advisor's skills and how they changed through "learning with counseling affordances", we extended the measurements from the first evaluation and applied a comprehensive measuring instrument. In our study, we made use of the KODEX[3] measuring instrument (Heyse and Erpenbeck, 2007; Erpenbeck and von Rosenstiel, 2007), which can be used to assess, measure, and diagnose employees' work-related skills, including their professional, methodical, social/communicative, personal, and activity/action-oriented skills. As the KODEX measuring instrument[4] used is very comprehensive, we focus in this paper on the data related to the solution objectives (SO1 to SO3). In greater detail, for SO1 to SO3, the questionnaire contained items to assess advisors' systematic-methodical skills to guide clients though a structured process, their media competences (to have the knowledge and methodical skills to utilize and integrate available information sources), and their ability to adapt existing processes (personalization). For SO2 and SO3, items were added to

[3] Originally, Prahalad and Hamel (1990) in the field of management developed the concept of core competencies in organizations. In the German-speaking world, it has been the work by Erpenbeck and von Rosenstiel (2007) that has been most often used to research corresponding competencies and its components. Heyse and Erpenbeck (2007) translated their comprehensive competence concept into the KODEX instrument to assess, measure, and diagnose personal competencies.

[4] To apply the KODEX measuring instrument, the questionnaire-items for the superior competence areas need to be adapted to the respective job specifications. This was done in our study by, first, analysis of employment documents (job description, job ads, etc.) and the creation of an initial catalogue, and, finalization in an expert group consisting of two managers from the public administration of Mannheim and one scholar with longstanding expertise on performance description in public administrations.

assess advisors' dialog/communication skills, their professional skills (having sufficient expert knowledge for their work tasks), their methodical knowledge, and their personal skills when dealing with complicated or ill-defined situations. Additionally, further items comprised of participants' perceived satisfaction with the advisory service (Yield Shift Theory; (Briggs et al., 2012), e.g. "I am satisfied with the received advisory session" and their perceived relatedness (included in the IMI measuring instrument (intrinsic motivation inventory; (Deci and Ryan, 2003), e.g. "I felt close to the advisor". All items were rated on a 7-point Likert scale (7=pos. max.). Finally, items were added where the advisors could value the usefulness of the individual implemented counseling affordances i) absolutely (on a 7-point Likert-scale), and ii) relatively (by ranking them).

### *3.8.3 Results*

#### *3.8.3.1 General results: Comparing the two design-and-evaluate Iterations*

In comparison to the first evaluation's working with *facilitation affordances*, the second evaluation' results showed that when working with *counseling affordances*, front office employees could improve their skills as advisors and provide a more satisfying advisory service. The advisors' perceived satisfaction with their work increased from 4.4 in the conventional to 5.5 in the artifact-supported advisory sessions (statistically significant difference; two-sided t-test, $T(11)=2.564$, $p=0.026$). And the clients' perceived satisfaction with the advisory sessions increased from 5.5 in the conventional to 6.2 in the artifact-supported advisory sessions (statistically significant difference; two-sided t-test, $T(35)=2.854$, $p=0.007$). Furthermore, when comparing the two design-and-evaluate cycles, advisors as well as clients were, after the second iteration, considerably more satisfied with the artifact-supported advisory sessions than after the first iteration (client satisfaction in the first evaluation 5.6 and now 6.2, advisor satisfaction in the first evaluation 5.1 and now 5.5). Additionally, the advisors could now make better use of the IT artifact in advisory encounters with clients and could

thus enable them and the clients to benefit from this support: While the clients' ratings of the advisors' media skills did not improve in the first evaluation (5.5 in both settings), the increase is substantially higher in the second evaluation (from 5.53 to 6). In the following paragraphs, we highlight to what extent the advisors could perform as skilled advisors when working with *counseling affordances* and how the solution objectives (SO1 to SO3) were met.

#### *3.8.3.2 "Process Design"-related skills as advisors (addressing SO1 and SO3)*

Our observations revealed that all 12 advisors began to moderate the advisory process more actively (addressing SO1): Whereas in the conventional advisory sessions, the advisors limited themselves to reactively answering clients' direct questions, they began to proactively ask questions and explain their actions to clients in the artifact-supported sessions. Therewith, the advisors established an active dialog and directed the advisory process more purposefully. In this context, the advisors valued their ability to control and steer the advisory process substantially higher in the artifact-supported advisory sessions than in the conventional ones (on average, 6.1 in the artifact-supported sessions, but only 5.4 in the conventional sessions; significant difference, two-sided t-test: $T(35)=2.335$, $p=0.025$). The advisors' behavioral changes were also recognized by the clients, who valued the advisors' methodical skills to adapt the advisory process to their preferences significantly higher in the artifact-supported sessions then in the conventional ones (on average, 5.6 in the artifact-supported sessions, but only 5.2 in the conventional sessions; significant difference, two-sided t-test, $T(35)=2.11$, $p=0.04$). Furthermore, all 12 advisors started to moderate the transition from needs elicitation to solution-finding more explicitly. They performed their actions of moving the elicited needs into the transition area (in the *CitizenExplorer*) and switching to the solution-finding screen visible to the clients, while giving them elaborate explanations of each action (addressing SO2). In this context, the clients perceived the results from the artifact-supported advisory session as

significantly more comprehensible (on average, 5.1 in the artifact-supported and 4.6 in the conventional sessions; two-sided t-test, $T(11)=3.823$, $p=0.003$). One client stated: "[in the artifact-supported session] I understood the solutions better […] how they match my needs." The advisors provided rationales for their behavior, referring to the increased control of solution discussions as well as to keep the client involved. One advisor stated: "I discussed with the client the order in which we wanted to discuss the cards. […] This way, I had better control of the discussion." Another advisor mentioned: "[…] therewith, the client was informed and could tell me possible concerns right away."

*Applying tools to support process design*: clients generally perceived that in the artifact-supported advisory sessions, the advisors were significantly better able to integrate available media into the advisory conversation than in the conventional sessions as perceived by the clients (6 in the artifact-supported advisory sessions and 5.5 in the conventional sessions; two-sided t-test, $T(35)=2.112$, $p=0.042$). In the artifact-supported advisory sessions, the consultations began to apply the available tools and information resources much more intensively within their moderating and guiding tasks than advisors then in the conventional ones (addressing SO1). In the needs elicitation phase, the advisors applied the two-level tag cloud as collaboration material, more actively inviting clients to participate in tool usage and thus in discovering and collecting clients' needs (on average, two verbal invitations in artifact-supported advisory sessions, no verbal invitations in the conventional sessions). According to our observations of the artifact-supported advisory sessions, 11 of 12 advisors started to explain their transition actions (between needs elicitation and solution-finding) explicitly to the clients while concurrently pointing to the "transition area" in the *CitizenExplorer* to support explaining how they prepared the elicited problems and needs for the subsequent solution-finding phase. In their assessments, the advisors especially appreciated the transition area feature and valued their usefulness fairly high (on average, 6.58, whereas 7=pos. max.). The clients also recognized the advisors' changed behavior: They

valued the advisors' methodical skills to adapt the advisory process significantly higher in the artifact-supported sessions than in the conventional ones (see values above). Furthermore, the clients perceived the final advisory results in the artifact-supported session significantly more comprehensibly than in the conventional ones (see values above).

#### *3.8.3.3 Social skills as advisors (addressing SO2 and SO3)*

When working with the counseling affordances, the started to act as facilitators more constantly, also when operating the IT tool in the solution-finding phase, and integrated the clients stronger in their information search activities. In their feedback, four advisors explicitly highlighted the feature of the forward awareness traffic light as especially useful, helping them to act more self-confidently in front of clients as well as to integrate information more fluently in the solution-finding activities (addressing SO3). One advisor mentioned: "With the information from little lights, I could guide the solution discussion much better". Another noted: "Having this advance information, I could act more confidently [...] explaining to the client what we do." Only in five of the 36 artifact-supported advisory sessions could we observe breakdowns of the work relationship between advisors and clients, coinciding with the advisor being intensively focused on the IT tool. In this context, the clients valued the perceived relatedness in the artifact-supported advisory sessions substantially higher than in the conventional ones (on average, 5.4 in the artifact-supported sessions and only 4.6 in the conventional sessions; significant difference; two-sided t-test, $T(35)=3.171$, $p=0.003$). Furthermore, they noticed and favored the advisors' changing behavior in their assessments of the advisors' individual skills. They rated the advisors' dialog and communication skills significantly higher in the artifact-supported advisory sessions than in the conventional ones (6.1 in the artifact-supported advisory sessions and 5.3 in the conventional sessions; significant difference: two-sided t-test, $T(35)=3.698$, $p=0.001$). Compared to the first evaluation, the clients perceived that they and the advisors could establish a more intimate relationship in the second

evaluation's artifact-supported advisory sessions (they valued their relatedness at 4.2 in the first evaluation and at 5.4 in the second evaluation).

*Applying tools to support social interaction*: Compared to the conventional advisory sessions, 11 out of 12 advisors in the artifact-supported sessions began to make extensive use of the available tools and information resources throughout the encounter, and integrated them as essential part of their interactions with clients: In the needs elicitation phase, they began to use the two-level tag cloud to enrich discussions with clients with further relevant problem information, while concurrently sustaining a close relationship and active dialog with clients (addressing SO2 and SO4): 11 out of 12 advisors directly embedded all the client's requests into the tag cloud and used the presented context information to provide additional information and thus to advance a comprehensive needs elicitation (addressing SO4). In this context, the advisors valued the two-level tag cloud as the most useful features provided by the *CitizenExplorer*. In the interviews, the advisors emphasizing that the additional context information considerably simplified integrating information into discussions. One advisor described: "The smaller cloud especially helped me to match the needs of the clients with information in the tool." The clients perceived the advisors in the artifact-supported sessions to have substantially better expert knowledge, compared to those in the conventional sessions (on average, 6.4 in the artifact-supported sessions, but only 5.75 in the conventional sessions; significant difference, two-sided t-test, $T(35)=3.489$, $p=0.001$). Analyzing the solution-finding phase in the observed advisory sessions revealed that eight out of 12 advisors made use of the forward awareness information they received when writing a new problem statement on a memo card. In detail we observed that these advisors adapted their discussions with the clients to a particular problem as soon as the information about possibly available solutions occurred.

## 3.9 Discussion and Implications

The evaluation's results indicate that "working with counseling affordances" can substantially improve the advice-giving behaviors of front office employees on-the-job. Summarizing, the evaluation provides preliminary support for our working hypothesis: Appropriately designed affordances will gently move advisors to try out novel advisory behaviors during their service encounters and will thus start experiential learning episodes, resulting in improved advice-giving behavior. Thus, blending counseling affordances into experiential learning revealed to be an effective on-the-job qualification measure. Figure 3.9-1 depicts our "learning with counseling affordances"-approach and includes short descriptions of each phase.

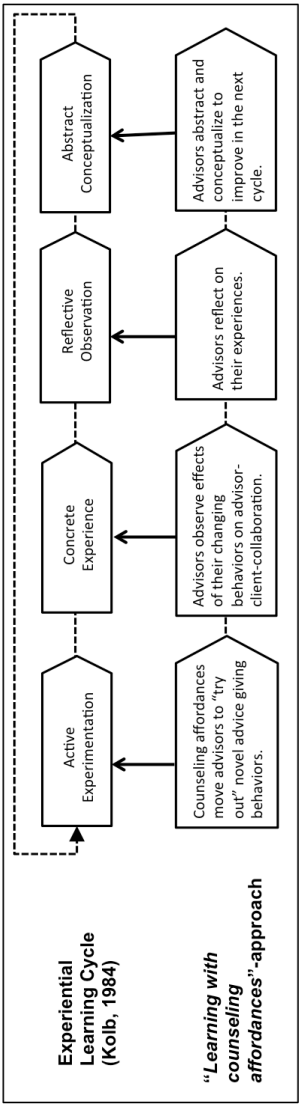


**Figure 3.9-1: "Learning with counseling affordances": blending counseling affordances into Kolb's (1984) experiential learning cycle**

With the developed design principles for equipping artifacts with counseling affordances we described how the "appropriately designed" affordances in our "learning with counseling affordances" qualification approach should be designed. Thereby, we disclosed front office employees' fundamental deficiencies to provide sound customer advisory service, and developed – in two design-and-evaluate cycles – a set of well-founded counseling affordances to help these employees to enhance their work-related skills on-the-job.

When creating an on-the-job learning environment for front office employees, our study revealed that available tools and information resources in the work environment should become an integral part of employees' shared cognitive processes, helping them to offload cognitive tasks whenever practical (Hollan et al., 2000), thereby reducing cognitive workload. Facilitating the usage of tools and information resources as collaborative material (DP3) and as contextualized memory aid (DP5), enwrapped within a shared information space (DP1 and DP4) revealed as suitable means to create a collaborative work environment in which employees become encouraged to integrate available auxiliary means more beneficially and purposefully into their work. Thereby, the implemented counseling affordances help counteract perceptions of IT as a communication barrier, promoting the concept of IT as communication support in face-to-face service encounters – as Rodden et al. (2003) advocate in their work. More importantly, the implemented counseling affordances help employees acquire new knowledge and learn new possible applications of tools and information resources, thereby enhancing their personal work-related skills. The implemented counseling affordances thus support creating effective learning opportunities in the workplace – as Billett (2004), Skule (2004), and Ellström (2001) have called for. Therewith, we could also highlight how organizations can transform their existing tools and information resources into an actual supporting and empowering work environment for their front office employees – as Danziger and Andersen (2002) have called for.

In the on-the-job learning environment, front office employees need to cope with the increasing cognitive workloads caused by their simultaneous tasks of giving sound advice to clients (as their job), and concurrently learning new knowledge and enhancing their work-related skills (improving their job performance). In this context, our study revealed that providing forward awareness information (DP6) turned out to be a suitable means to help advisors gain better control on the advisory discussions. As Kirschner et al. (2004) described, *tasks control* is essential for successful educational tasks. Thus, employees were encouraged to reflect on performed actions and their effects for future process steps and began to actively adapt the problem-solving process as an essential part in their experiential learning cycle (Andresen et al., 2000; Kolb, 1984).

Counseling affordances, in their role as educational affordances (Kirschner, 2002), should invite and guide front office employees to learn about novel advice-giving behaviors. To this end, the developed counseling affordances help make advice-giving practices "experienceable" for advisors and clients. The affordances thus help learners to recognize novel practices and to realize their educational potential, which Lai et al. (2007) consider an essential precondition to enable learners to start experiential learning. In our study, we highlighted the beneficial effects of following such an experiential approach for establishing effective on-the-job learning: By providing connected problem-solving spaces (DP2), the problem-solving process could become "experienceable" for advisors and clients. While following the counseling affordances' suggested action possibilities like a scaffold, advisors could learn about structured problem-solving (in terms of experiential learning), while performing in their jobs and providing superior advisory services to clients. Therewith, we answer the call by Bower (2008) and Kirschner (2002) to deepen understandings of the relationship between affordances and learning. In detail, we highlighted how affordance can be designed and provided to front office employees to make learning material *experienceable*, thereby facilitating initiating experiential learning on-the-job.

## 3.10 Conclusion and Limitations

In this paper, we described a novel approach to qualify service personnel on-the-job using *counseling affordances*. The introduction of correspondingly equipped facilitation artifacts into service personnel's work practices (cf. Figure 3.9-1) may bring them to start experiential learning processes (Kolb, 1984), and enables them to learn and improve their advice-giving behavior. In the context of citizens' advice services, we tested our approach and found preliminary support for our working hypothesis: First, front office administrators developed, after "working with a facilitation artifact", substantially improved advice-giving behaviors. Second, while giving advice using the facilitation artifact, the administrators were actually moved to start experiential learning, that is, trying out novel advice-giving work practices and experiencing their effects within the service encounters with clients.

While traditional qualification measures focus on enabling employees to operate available tools, it is essential that service personnel also learn how to deliver the value of these tools to the customers, thus providing superior customer service. In this context, we highlighted the benefits of using affordances for on-the-job learning: An artifact that provided appropriately designed counseling affordances led front office employees to start experiential learning and, ultimately, improving their advice-giving skills. Therewith, we could show how front office employees' workplaces could be effectively transformed into learning environments, and employees could be provided with suitable learning opportunities – as Billett (2004), Skule (2004) and Ellström (2001) have called for. By showing how counseling affordances should be designed and demonstrating how they can support initiating experiential learning on-the-job, we answered the call by Bower (2008) and Kirschner (2002) to deepen understandings of the relationship between affordances and learning and could directly contribute to this scientific discourse.

With our novel qualification approach for service personnel, applied in the context of citizens' advice services, we continue and extend the work by Leitner (2006), Schuppan (2010), or Hummel and Krcmar (2003), answering their call to highlight how public employees could concretely develop the necessary skills to work in modern public administrations. Therewith, we directly contribute with our on-the-job qualification approach to the current scientific discussion on public sector modernization. Furthermore, we could deepen the knowledge on the skills of today's front office employees, highlighting their IT-related deficiencies and their severe influences on customer service encounters. Practitioners in public administrations can profit from our findings and apply the "learning with counseling affordances"-approach to qualify their front office employees on-the-job, thereby improving customer service quality. To this end, and to optimize the qualification approaches' efficiency, they should meet the implementation requirements we presented in the discussion section, i.e. they should have an IT artifact equipped with counseling affordances, should have clients (actual or stand-in) for the advisors to gain experience with, and should provide time and means for reflection.

By developing higher-level design principles for counseling affordances, we argue that our approach can be transferred from the case of citizens' advice services to other service domains such as financial advisory services or advisory services in travel agencies. These design principles can guide developers of future advisory support systems and can lead to improved customer advisory service. Therewith, we contribute to the design knowledge on advisory information systems, adding the user empowerment aspect and highlighting its implications on system designs (manifested in the set of design principles for counseling affordances). However, the particular artifact design emerged from multiple design-and-evaluate cycles in the domain of citizens' advice services. Accordingly, the instantiations of the counseling affordances were customized to support face-to-face advisory service encounters in public administrations' front offices. They may therefore not directly fit other domains, and we propose that specific design

and instantiation are best elicited in a dedicated design-and-evaluate process.

While working with front office employees in a real-world context allowed us deep insights, our research approach also has limitations. Our study was conducted entirely in the public administration of Mannheim in Germany. Current work practices and organizational conditions may differ in other countries' public administrations and should be assessed before applying our on-the-job qualification approach. A further issue is the number of participating advisors in the evaluations. We were limited concerning employees participating in the evaluations as they must not interfere with the public administration's daily work. Furthermore, in this context, the evaluations could only be conducted in a shorter period test setting, which did not allow us to make statements on the appropriation of the IT artifact and on organizational integration. In this context, at the time of writing, a longer period pilot test is running in three citizen advice bureaus in Mannheim, to gather deeper insights into these aspects of appropriation and organizational integration.

In summary, "learning with counseling affordances" turned out to be an effective approach to qualify service personnel on-the-job. In the resource-constrained organizational environment of public administrations' front offices, it provides managers with a suitable alternative to previous learning-from-others approaches, to instruct and support their employees in extending their knowledge and skills where it matters, within actual customer service encounters.

# 4 SERVICE ENCOUNTER THINKLETS: HOW TO EMPOWER SERVICE AGENTS TO PUT VALUE CO-CREATION INTO PRACTICE

Research essay III[5]


### *Abstract*

*The concept of value co-creation and the service encounter as locus of this value co-creation gained much academic interest, notably in marketing research and service sciences. In the existing bodies of research literature, the conceptual shift from firm-centric service provision to co-productive customer-firm interactions is well discussed. Researchers describe the underlying premises and antecedents of co-productive service encounters, the technical design of information systems, and their effects on service systems and service science. Whereas the current research discourse mainly follows conceptual perspectives, research on the practical implications on the service agents enabling co-creation of value in the IT-supported service encounters with clients is scarce. In this paper we want to bridge this gap and first use the example of IT-supported citizen advisory services to show the fundamental deficiencies of today's service agents regarding the implementation of value co-creation work practices. We introduce the concept of service encounter thinklets, adapted from collaboration engineering, to overcome these deficiencies and to empower service agents to put value co-creation into practice. We show how service encounter thinklets can complement existing advisory support measures and together create a socio-technical framework to enable service agents to transform the IT-supported customer service encounter into a collaborative work environment, bringing themselves, customers and supporting information systems together to co-create the advisory's value. A test with employees in a public administration's front office gave first evidences that service encounter thinklets can effectively empower service agents on-the-job to adapt their work practices and bring value co-creation into practice.*


[5] Research essay III is co-authored by Gerhard Schwabe, University of Zurich, and is currently under review at the Information Systems Journal.

## 4.1 Introduction

The concept of value co-creation and the service encounter between clients and organizations as locus of this value co-creation gained much academic interest, notably in marketing research and service sciences. The underlying service-dominant logic argues that value is defined and co-created with the clients rather than embedded in a organization's output (Vargo and Lusch, 2004). In the respective bodies of research literature, the conceptual shift from organization-centric service provision to co-productive customer-organization interactions is extensively discussed. The scientific discussions focus on the fundamental premises and underlying concepts of value co-creation as an essential part of the relationship between clients and organizations, highlighting their effects on the service encounter, service systems and service science (Grönroos, 2008; Prahalad and Ramaswamy, 2004a; Vargo et al., 2008; Vargo and Lusch, 2004). These discussions provide conceptual insight on the client-organization relationship and the service encounter as the locus of value co-creation. However, insight and suggestions on how organizations, or the service agents as their representatives, can establish co-creation of value, are lacking.

Also information systems research recognized the importance of establishing value co-creation experiences in service encounters: Numerous researchers discussed extensively how to improve advisory service encounters with suitably designed IT-artifacts (e.g., Giesbrecht et al., 2014; Halloran, 2002; Kira et al., 2009; Novak, 2009; Nussbaumer et al., 2012; Rodden et al., 2003; Schmidt-Rauch and Schwabe, 2011). In their studies, they address different aspects, like e.g., communication, relationship building, learning, trust, or accessibility, and show how to design technical information systems to improve collaboration in customer service encounter. Thereby, researchers elaborate extensively on the technical design of developed IS-solutions, describing design requirements and design principles to be considered when implementing them. However, they hardly provide insights on the work practices and social interaction patterns necessary that skilled users, i.e., the

advisors, need to follow or execute to make effective use of such IS-solutions. Knowing from research on groupware and computer support collaborative work, these users, who act as facilitators, can have large influence on corresponding IS solutions' success (c.f., Anson et al., 1995; Bostrom et al., 1993; Griffith et al., 1998). In consequence, the effects of missing information about information systems' social component can be far-reaching: Researchers can be severely hampered to repeat experiments and evaluations to verify scientific results or simply to conduct another design iteration to improve system design. Also practitioners in service providing organizations can strongly struggle to make beneficial use of research results, as essential knowledge for successful deployment of developed IS-solutions are missing. Reviewing design-oriented IS research literature in the context of advisory service encounters revealed that previous research mostly do not provide sufficient information on the central role of service agents' work practices, their qualification and their influence on information system's success regarding establishing co-creation experiences in customer service encounters.

In this paper, we want to bridge these gaps by answering the research question, *how service agents can be empowered to establish co-creative interactions in their IT-supported service encounters with clients*. In the face-to-face service encounter, the service agents are central to transforming co-creation opportunities into actual co-creation experiences for the clients. Establishing corresponding co-creative service encounters could allow for more individualized service configurations and therewith increase service quality and customer satisfaction (S. Schmidt-Rauch and Nussbaumer, 2011). In our research approach, we take on an Information System research perspective focusing on the service encounter in terms of technology mediated interaction and collaboration. We argue that such interaction and cooperation is at the heart of value co-creation and therewith can inform the design and support of co-creative service encounters.

In answering the research question, we take on a comprehensive view on information systems, that is, seeing them as socio-technical systems. We

investigate their technical as well as their social component to understand and show how information systems can help empowering service agents to put value co-creation into practice in their IT-supported service encounters. In our research, we follow an action design research approach, integrating both theoretical insight from current state of research and knowledge of service agents' actual work practices. We will base our discussions on face-to-face citizen advisory services (occurring in public administration's front offices), as they constitute prime examples of co-creative service encounters, i.e., where service personnel directly interact with clients to co-create value. We first present a purely technical approach to support advisors to establish value co-creation with their clients. Based on observation of the work practices of six advisors conducting citizen advisory sessions, we identify their fundamental deficiencies to put value co-creation into practice and highlight how they exceed the technical support's capabilities. In our solution, we introduce the concept of *service encounter thinkLets*, adapted from the idea of thinkLets used in collaboration engineering. Service encounter thinkLets represent social interaction guidelines helping service agents to invoke co-creative interactions in their service encounters with clients (see section 4.5 for detailed description). In an evaluation with twelve real advisors and 36 clients, we show how this approach contributes to resolve the advisors' deficiencies and thus empower them to establish co-creative work practices with their clients. The evaluation gave first evidence of the socio-technical framework's large potential to enhance customer service encounters. Advisors were efficiently empowered to establishing co-creation experience for their clients, resulting in increased work satisfaction and work performance perceived by the advisors, and in increased customer satisfaction.

With our research findings, we want to contribute to the scientific discussion on IS research, specifically in the context of service encounters, highlighting how IT-systems could be designed and deployed to support users in establishing co-creation experiences in advisory service encounters. Furthermore, we want to contribute to the scientific IS discourse on

collaboration engineering, showing how the concept of thinkLets could successfully be adapted from their large group application area to dyadic collaborations. We also want to provide practitioners in service providing organizations with guidelines and suitable measures for successfully implementing IS-solutions to support value co-creation in customer service encounters. They can benefit from our insights to improve qualification measures of service personnel and thus to ensure higher and more consistent customer services quality.

## 4.2 Value co-creation in the advisory service encounter

The underlying service-dominant logic describes the concept of value co-creation as a shift from an organization- or product-centric view on service provision to a view of organizations and clients co-create value with each other in their interactions. Prahalad and Ramaswamy (2004a, 2004b), for instance, describe service delivery as *co-creation experience*. They argue, that organizations need to establish co-creation experiences in their client-organization interactions in order to co-create value with their clients. Their perspective of experiencing the co-creation of value focuses on interactions and proceeds from merely describing what service-dominant logic comprises to discussing how its content could be transferred into the service encounters between organization and clients. However, regarding the scientific value co-creation discourse in the corresponding bodies of marketing research and service science literature, researchers are mostly concerned with the fundamental premises and concepts (Grönroos, 2008; Vargo et al., 2008; Vargo and Lusch, 2004) and its implications on service systems or service science (Grönroos, 2011; Grönroos and Voima, 2013; Maglio and Spohrer, 2007; Needham, 2008; Spohrer and Maglio, 2008). In consequence, the scientific discussions on how organizations, specifically the service agents as the organization's representatives, could put value co-creation into practice, are scarce.

The direct interactions between organizations and clients represent the principal locus of value co-creation (Grönroos, 2011; Payne et al., 2008; Prahalad and Ramaswamy, 2004a; Vargo et al., 2008). Payne et al. (2008), for instance, describe specific *value-creating processes* for customer involvement, placing the clients – as co-creators of value – on the same level of importance as the organization. With the description of these processes and their interrelations, Payne et al. provide a framework to manage the process of value co-creation. In a similar approach, Grönroos and Voima (Grönroos and Voima, 2013) emphasized the importance of providing *value co-creating opportunities* in the process of service delivery. They introduce three value creation "spheres" and elaborate on clients' and service provider's value (co-)creating roles in each of them. Whereas these frameworks help organizations to identify basic co-creation opportunities and planning of a value co-creation agenda or strategy, they only provide little (if any) insight or practical suggestions on how organizations, or service agents as their representatives, can establish the actual co-creation experiences for their clients.

The advisory service encounter represents a prime example of a co-creative service encounter (S. Schmidt-Rauch and Nussbaumer, 2011). Originating in psychology, advisory services' principal objective is to enable clients to resolve their problems on their own (Schwartzer and Posse, 1986; Warschburger, 2009) and thus provide the clients with decision guidance for their problems. In the advisory service encounter, the value is principally co-created: Advisors and clients both have to provide distinct information and actively participate in the collaboration to develop solutions (the advisor's area of expertise) that suit the client's problems (the client's area of expertise). On the one hand, the advisors have to involve the clients in a dialogue to learn about the information about their needs in order to create a shared understanding of the clients' problem situation. On the other hand, the clients need to receive information from the advisors about the possible solution and evaluation criteria, so that finally, they decide together for the most suitable solution. In this situation, service personnel have to become

distinct advisors, involving their clients in structured problem-solving activities (Giesbrecht et al., 2014) and provide co-creation opportunities (Payne et al., 2008; Prahalad and Ramaswamy, 2004a). The advisors need to act in the role of facilitators, possessing the necessary professional knowledge as well as the methodological and personal skills to i) guide their clients through a structured problem-process, ii) suitably apply available tools and information resources within this process, while c) establish a constant and close relationship to the clients (Giesbrecht et al., 2014). The advisors (as the organization's representatives) are responsible to actively involve the clients in the value creation process and establish value co-creation experiences for the clients (Grönroos and Voima, 2013; Prahalad and Ramaswamy, 2004a, 2004b).

However, value co-creation experiences are not established automatically. Each phase in the advisory process requires the participants to play their role as co-creators. The following paragraphs highlight how value co-creation manifests within the individual phases of the advisory process and what tasks arise for the advisors to establish value co-creation experiences for the clients.

The advisory process, as a decision-making process could suitably be described in the three phases of Simon's process for decision-making or problem-solving (Simon et al., 1987): *intelligence* (where the needs for a decision are identified and the required background information is collected), *design* (where possible solutions are developed), and *choice* (where the solutions are evaluated and the most suitable one is chosen).

***Value co-creation in the intelligence-phase***: To start a joint problem-solving process (Schmidt-Rauch and Schwabe, 2011), advisors and clients need to establish a shared understanding of the clients' needs. At this stage of the problem-solving process, these needs can be rather fuzzy and sticky (Eric von Hippel, 1994), being only accessible to the clients themselves (S. Schmidt-Rauch and Nussbaumer, 2011). Accordingly, the advisors have to get into conversation with the clients to gather the information needed to develop a problem statement that is clear to both parties. Thus the advisors

have to establish an active dialog with mutual information exchange between them and the clients as equal and joint problem solvers (Prahalad and Ramaswamy, 2004a), when supporting the clients in expressing their explicit as well as implicit needs. In these activities, the advisors need the methodological skills to make appropriate use of available tools and information resources to support the cooperative elicitation of the client's needs.

***Value co-creation in the design-phase***: The clients are assumed to have little knowledge about the possible solutions of their problems and the process of finding them. Accordingly, in this phase of the advisory process the advisors have to exert their profound domain knowledge to develop suitable solutions, i.e., to make corresponding value propositions. However, according to Sandström et al. (2008), value will not be gained until the clients have taken part in the advisory service's activities and make use of it. In this context, advisors have to provide the clients the same access and the same transparency of the available information. Accordingly, advisors need to exert the necessary methodological skills to guide the clients through the problem-solving activities and actively integrate them in their solution-finding strategies and particularly their usage of tools and information resources.

***Value co-creation in the choice-phase***: To establish a co-creation experience, the advisors need to integrate the clients actively in the evaluation of the possible solutions that have been developed. In doing so, they need to support them to develop suitable evaluation characteristics in order to enable the clients to finally choose the most suitable solution. Therewith, the advisors need to support the clients to assess the risks and benefits related to their potential decisions. Therefore, advisors and clients need to collaborate closely and create a shared understanding of the evaluation criteria enabling them to evaluate the possible solutions.

Information systems research also recognized the importance of establishing value co-creation in service encounters. Numerous researchers in design-

oriented information system research investigated the collaboration of advisors and clients in their face-to-face advisory encounters and highlighted the supportive role of technological artifacts (Giesbrecht et al., 2014, 2013; Halloran, 2002; Heinrich et al., 2014; Kira et al., 2009; Novak and Schwabe, 2009; Nussbaumer et al., 2012; Rodden et al., 2003; Schmidt-Rauch and Schwabe, 2014, 2011). Rodden et al., for instance, investigated how to design an interactional workspace for more effective face-to-face collaboration between customers and agents (Rodden et al., 2003). Kira et al. (2009) compared face-to-face and telephone advisory encounters to investigate technical information systems' respective characteristics for improving advisor-client-collaboration. Schmidt-Rauch and Nussbaumer (2011) and Schmidt-Rauch and Schwabe (2014) addressed the advisory encounter from a value co-creation perspective and highlighted specific problem areas regarding the co-creative nature of advisory services. Schmidt-Rauch and Nussbaumer (2011) introduced four guiding perspectives for the design of supportive IT-artifacts, namely service encounters as *learning process*, as *design process*, as *collaboration*, and as *experience*. And Schmidt-Rauch and Schwabe (2014) highlight how in the extension of face-to-face service encounters value co-creation can be maintained and thereto introduce design requirements for creating supporting IT-artifacts to resolve problems occurring in the context of value co-creation, namely the *problem of being limited to the verbal dialog*, the *problem of the stickiness of information needs*, the *burden-of-choice problem* and the *diverging goals problem*. Nussbaumer et al. (2012, 2009) focus on the expert-layperson-relationship and discuss how to design supportive IT-artifacts to resolve the resulting information asymmetry and to provide transparent information access to all participants. Heinrich et al. (2014) investigated in their study how to enhance relationship-building in advisory service encounters using tabletop systems.

Whereas the current scientific discussions provide valuable insight into the fundamental technical design of supportive information systems, they hardly provide insight on how advisors did apply corresponding IT-artifacts to establish co-creation experience in IT-supported service encounters.

Previous research studies mostly focus solely on describing and specifying the technical components of developed IT-artifacts and thus neglect the social component, which comprises, for instance, the actors' work practices when applying the IT-artifacts in their advisory collaboration. Even though these research studies mention some sort of training or qualification of service agents, either conducted together with introducing their IT-artifacts or at least mentioned it as necessary preconditions for successful introduction, they rarely provide insights on these important qualification aspects. In consequence, researchers struggle to repeat experiments and evaluations to confirm scientific results or even to conduct further design iterations to improve system design. Furthermore, service providing organizations – constantly required to extend their service offerings – can rarely benefit from corresponding research results, not knowing how to communicate appropriate work practices to their service personnel along with introducing novel supportive IT-artifacts. Reviewing previous design-oriented IS research literature revealed that researchers frequently do not provide sufficient information on the role of the service agents as primary users of their IS-solutions, their work practices, their qualification and ultimately their influence on information system's success to promote co-creation experiences. In this context, we argue, that a suitable framework, that would provide today's researchers with guidance how to describe such work practices and social interaction patterns is currently missing.

## 4.3 Research design

The research question on how service agents could be empowered to establish co-creative interaction in their service encounters appeared in a larger research project. In this research project, a novel citizen advisory service is developed and implemented in the front office of the public administration of a major German city, and its technical and organizational effects are investigated. The research project follows an action design research approach (Sein et al., 2011). Sein et al. (2011) describe the individual stages of action design research as I. problem formulation, II. building,

intervention and evaluation, III. reflection and learning, and IV. formalization of learning. Accordingly, we follow in this paper the same research approach, but focus in the individual stages on data collection, findings and deductions relating to the service encounter and the advisors' capabilities. The action design research approach, promoting a close researcher-practitioner-relationship, suits our research well as it helps bring together the theoretical perspective from the current state of research on value co-creation and the practical perspective of service providers including their service agents' work practices. Therewith we also want to respond to the call of van de Ven and Johnson (2006, p. 802) to "not only enhance the relevance of research for practice but also contribute significantly to advancing research knowledge" in the domain of service science and IS research. In this paper we address the individual stages of action design research in the following sections:

***Problem description*** *(addressing I.):* To investigate today's advisors' work practices and identify the most influential deficiencies to putting value co-creation into practice, we report from a first explorative study (cf. previous publication; Giesbrecht et al., 2014) where six advisors – provided with purely technical support – conducted advisory sessions with twelve clients. We describe the details of the study at the beginning of the problem description section. Based on the identified deficiencies, we derive corresponding solution objectives, which should be met by a suitable solution.

***Solution description*** (addressing II. building): We describe our solution of building a socio-technical framework, where we introduce *service encounter thinkLets*, adapted from the concept of thinkLets from collaboration engineering (Briggs et al., 2003, 2001; De Vreede et al., 2006).

***Evaluation*** (addressing II. intervention and evaluation): In order to evaluate whether our solution, i.e., the socio-technical framework enabled the advisors to put value co-creation into practice, we report from a second user test conducted in the same organization as in the first study. Being important for our research approach, we therefore want to increase the external

validity of our findings. In action design research the evaluation settings could not always be controlled completely but Sein et al. emphasized that authenticity constitutes "a more important ingredient for action design research than controlled settings" (Sein et al., 2011, p. 44). The details of the user test are described in the evaluation section.

***Discussion and Conclusion*** (addressing III. and IV.): We discuss the findings from the evaluation. In doing so, we reflect on the service encounter thinkLets' effect on advisors' co-creative behavior, intended or unintended. Furthermore, we highlight the service encounter thinkLets' value for theory and practice and conclude with an outlook.

## 4.4 Advisors' deficiencies to put value co-creation into practice

Advisors face a number of challenges to establish co-creative interactions with their clients and these challenges can also exceed the supportive capabilities of technical support provided by means of corresponding IT-artifacts. In this section, we want to highlight these challenges by reporting from our research on IT-supported citizen advisory services in a public administration's front office, conducted in January 2013.

To identify some of the advisors' most influential deficiencies to put value co-creation into practice, we observed the advisors in their current work practices and used Prahalad and Ramaswamy's DART model (Prahalad and Ramaswamy, 2004a, 2004b) as a framework to investigate how they applied or did not apply value co-creative work practices. Prahalad and Ramaswamy (2004a, 2004b) present a model describing the building blocks of interactions that facilitate co-creation experiences, called the DART model (dialog, access, risk assessment, transparency). Therein, a *dialog* needs to be established between the organization and the clients to define and resolve the clients' problems. An active dialog implies, interactivity and the ability and willingness to act on both sides (Prahalad and Ramaswamy, 2004a, p. 9). However, for establishing an active dialog in the service encounter, the

clients and the organization have to become joint problem solver with equal rights. To enable both parties to actively participate as co-creators in the interaction, existing information asymmetries need to be reduced, wherefore Prahalad and Ramaswamy argue, that they need the same *access* and equal *transparency* to information. Implementing dialog, access, and information can assist clients in assessing the *risk*-benefits of a certain course of action or decision, making them informed decision-makers and taking more responsibility for the co-created service or product. We argue, that the DART model with its building blocks for co-creative interactions (Prahalad and Ramaswamy, 2004a), provides a comprehensive framework to is suitable to investigate the collaborative behaviors of service personnel regarding their (missing) efforts to establish value co-creation experiences.

### *4.4.1 The case of IT-supported citizens' advisory services*

In citizens' advisory services, administrative clerks give advice to citizens in face-to-face service encounters in the front office of a public administration. These employees rarely have an extensive training as advisors, but possess profound domain knowledge as well as work experience to help citizens with their government-related issues. In our study, to better observe the advisors' work practices, we focused on advisory sessions, where citizens with more complex information needs request advisory services. In detail, we focused on new inhabitants of the city, which in their social situation have similar (missing) prior knowledge about local government-specific administrative issues. The study aimed to empower the advisors in their advisory-related skills, specifically their skills as facilitators of the problem-solving collaboration with the clients (cf. value co-creation in advisory service encounter section), and in this way enhance their advice-giving behavior. Therefore, the advisors in the study were supported by an IT-artifact providing *counseling affordances*, i.e., technical functionalities to support advisors in their facilitator-related tasks. Accordingly, the individual counseling affordances provided technical support to the advisors a) to establish a structured goal-oriented advisory process, b) to apply appropriate tools and information resources during the individual

problem-solving activities and c) to maintain a close relationship with the clients integrating them into the individual advisory activities. In the following paragraph the individual counseling affordances that the IT-artifact provides, are concisely explained including their supportive effects on advisors (cf. the previous research essay in section 3 and Giesbrecht et al., 2014 for elaborate details on the counseling affordances and its effects).

**Figure 4.4-1: Physical positions in the artifact-supported advisory session: Advisor (right), client (left) and the IT-tool (on the table).**

The first counseling affordance, a *shared information space,* was physically established to support advisors and clients forming a collaboration of equal counterparts, both able to monitor and access tools and information (cf. Figure 4.4-1). In order to assist advisors in the individual problem-solving activities in applying the appropriate tools and information resources, the IT-artifact provides *problem-solving spaces* (second counseling affordance). In detail, a problem space and a solution space is provided (cf. Figure 4.4-2), each containing tools and information resources suiting the respective activity. To support advisors in structuring the advisory session more explicitly, the IT-artifact provides *slight process change bumps* (third counseling affordance): The transition between problem space and solution space has to be done more purposefully. In our instantiation, this is

accomplished by using a sliding mechanism. This enables users, to change between the two spaces by touching the screen and sliding it to the left or right (only one space is visible at a time). To promote the collaborative interactions between advisors and clients the IT-artifact *offers collaboration material and corresponding tools by using well-known metaphors* (fourth counseling affordance). For instance, for the needs elicitation phase, the IT-artifact provides a tag cloud containing words most often used to address the clients' needs and an empty area to be filled with these tags (cf. Figure 4.4-2). Finally, to support advisors in integrating available tools and information resources in the appropriate problem-solving activities, the IT-artifact *enwraps existing tools and information resources and includes them in the advisor-client-collaboration* (fifth counseling affordance).

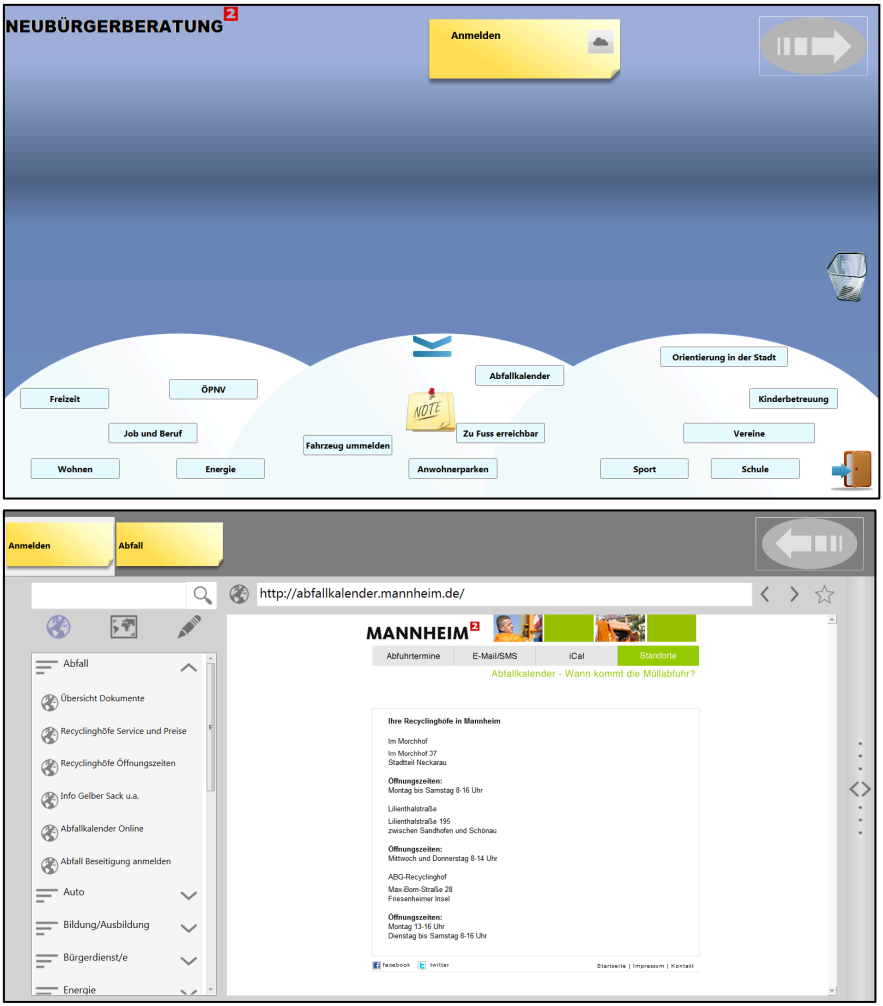


**Figure 4.4-2: The IT-artifact's "problem space"-screen (above) and "solution space"-screen (below). Only one screen is visible to the user at a time**

### *4.4.2 Study design and data collection*

The study was conducted in form of a user test with a within-subject test design. Six advisors gave advice to twelve clients in 24 advisory sessions. The advisors in the test came from the public administration of a major German city, where they work in the front office conducting face-to-face citizen advisory services. The five female and one male advisor were between 20 and 57 years old (avg.: 32.7). The participating clients were recruited from among the clients of the public administration, the six female and six male clients were between 18 and 74 years old (avg.: 39.5). To study the advisor in contents wise similar advisory sessions, each client did take on the role of a new inhabitant of the city, seeking corresponding advice to resolve their government-related issues in their novel social situation, related to their relocation (registering themselves, learning about tax regulations, public transportation, waste system, etc.). Therefore, clients were selected, which just newly moved into the city (less than 6 month ago) to ensure a more homogeneous level of (missing) prior knowledge on local government-specific administrative issues. In order to identify the advisors' fundamental deficiencies, each advisor conducted two conventional advisory sessions and two advisory sessions supported by the IT-artifact. The advisors only received technical instruction how to operate the supportive IT-artifact, but no additional training on who to give advice. Each of the clients experienced two advisory sessions, a conventional and one supported by the IT-artifact. In the following paragraphs, we refer to the advisory sessions supported by the IT-artifact as "artifact-supported advisory sessions".

According the explorative nature of the study, the data were primarily collected with qualitative methods, specifically observations of the advisory sessions and semi-structured/narrative interviews with the participants, and complemented with quantitative data collected with a questionnaire. We collected data about the advisors' current work practices by recording all advisory sessions on video. To learn about advisors (non-)co-creative work practices, one researcher analyzed the recordings regarding how the building blocks for establishing co-creation experience from the DART

model (Prahalad and Ramaswamy, 2004a) manifested in the counseling service encounter between advisors and clients. In greater detail, the analysis focused on how advisors i) establish an active dialog with the clients (d*ialog*), ii) provide equal access to information (*access*), iii) provide transparent information (transparency), and iv) support clients in assessment risks and benefits of decisions (*risk-benefits*). Furthermore, to reveal the participants' underlying reasons for their behavior during the observed advisory sessions, we collected their direct feedback with semi-structured/narrative interviews. Due to the explorative character of the study, the catalogue of interview questions consisted of open questions allowing the interviewer to formulate additional detailed questions adapted on the interviewee's answers. The interview questions focused on the advisors' and clients' perception of the cooperation during the advisory session, e.g., "How did you perceive the collaboration with the advisor/client?" and their personal involvement in the value creation process, e.g., "How were you integrated in the advisory sessions individual problem-solving activities?". Finally, we complemented the participants' qualitative feedback and additionally collected some of their impressions quantitatively with a questionnaire, which they filled out after each session rating the just-experienced advisory session. Its items comprised of the participants' perceived involvement in the value creation process, e.g. "I felt myself involved in the creation of the result in the advisory sessions", their perceived service quality (Yield Shift Theory; (Briggs et al., 2012), e.g. "I am satisfied with the received advisory session", their perceived relatedness (included in the IMI measuring instrument (intrinsic motivation inventory); (Deci and Ryan, 2003; McAuley et al., 1989; Ryan et al., 1983; Ryan, 1982), e.g., "I felt close to the advisor", and. All items were rated on a 7-point Likert scale (7=pos. max.).

### *4.4.3 Insight on current (non-)co-creative work practices*

In general, our observations revealed that in all their advisory sessions, artifact-supported as well as conventional, the advisors did not manage to create a participatory work environment nor a constantly close collaboration

with the clients, integrating them in co-creative activities. The clients' feedback confirmed our observations, rating their personal involvement in the value creation process merely moderate (4.7 in the conventional and 5.1 in the artifact-supported advisory sessions; 7=pos. max., 4=neutral) Moreover, we could observe that in all of the advisory sessions observed, the work relationship between advisors and clients collapsed multiple times. The clients confirmed our observations, on the one hand, as they rated their relatedness to the advisors not significantly different from neutral (4.4 in the artifact-supported sessions and 4.6 in the conventional sessions, 4=neutral). And on the other hand, they emphasized the impersonal attitude or atmosphere of the advisory sessions in the interviews. One client stated: "The advisory session appeared quite impersonal to me […] I had the feeling of being outside." (All quotes are translated to English by the authors). A closer examination of the advisors' behavior in the individual phases of the advisory process revealed a number of deficiencies, when establishing co-creative interaction. These deficiencies also exceeded the supportive capabilities of the provided technical counseling affordances.

#### *4.4.3.1 Missing role understanding and role taking*

Despite the physically established shared information space (cf. Figure 4.4-1), that should facilitate advisors' and clients' collaboration, or the intensive use of available IT during the advisory sessions, hardly any of the advisors actually introduced the tool, together with its functions and its meaning for their collaboration, to the clients. In actual fact, only one of the six participating advisors introduced it explicitly. We could observe the same behavior in the conventional sessions, where none of the advisors introduced the clients to any of the tools or media they used, e.g., the register of residents. The resulting asymmetry between advisors and clients regarding the access, comprehend, and use of information during their ongoing service encounter (*access* and *transparency* issue) hamper the creation of a co-creative work atmosphere severely. In addition, the advisors also created a false role expectation within the clients with far-reaching consequences for further value co-creation: Without this introduction to the

tools that could be used, the clients were hampered in participating actively whenever the advisors used them. This increased the unwanted role allocation of the client as consumers and advisor as producer rather than that of two equal co-creators. In the interviews, the advisors gave reasons for their behavior describing their uncertainty about when to involve the clients in their usage of tools or information resources and when not. Five out of eight clients also remarked on this uncertainty mentioning that it hampered them from being more active and collaborating more. One client described this effect: "It appeared to me, that I could or should also interact with the tool, I also would have liked to participate […] but the advisor didn't seem to want it, or did she?" We refer to this problem of the advisors as *missing role understanding and role taking* **(P1)**.

*Why the counseling affordances did not suffice to empower the advisors*: In the advisory sessions' "initiation", the advisors have to put all their effort into establishing the appropriate work relationship with the clients. Technical functionalities to support the users in this phase have to be subtle, as they can quickly harm the creation of the advisor-client relationship and be perceived as communication barrier (Rodden et al., 2003). The advisors in our study received support in the form of the physically establish shared information space, which facilitated establishing a closer advisor-client relationship. However, the advisors failed to take on their role as active co-creators and struggled with this shared information space reflecting the concept of equal co-creators. They referred to it in their interviews stating that it would increase their vulnerability to the clients rather than enable a closer collaboration. One advisor summarized: "I am not fond of the shared space because the client can see when I can't find the right information at the first attempt."

#### *4.4.3.2 Missing knowledge about collaborative tool usage*

To facilitate value co-creation, advisors and clients should be able to use the available tools and information resources in a collaborative manner (addressing *access*). However, in the observed advisory sessions, the advisors

mostly stayed with a single usage mode and struggled to integrate the clients into a collaborative usage of the available tools, e.g., in the conventional sessions into the usage of the register of residence when searching for or editing information. In detail, only two advisors in the artifact-supported advisory sessions included the client actively while operating the IT-tool, while in the conventional sessions, none of the advisors included the client in their IT usage activities. The advisors gave reason to their behavior mentioning, e.g., "I did it as I do it at the service desk […] performing transactions. […] It's not easy to switch the mode." or "It didn't occurred to me that she [the client] wanted to participate […] in the end of the session, she mentioned it." The advisors' corresponding behavior may foster information asymmetry between advisors and clients, hampering the clients to perceive themselves as equal co-creators in the value creation process. We even could observe, that advisors transformed initially co-creative interactions back into product-centric activities. Concretely, the advisors often started an intensive verbal discussion with the clients working toward a common understanding of, e.g., a possible solution to the clients' needs, but stopped the conversation unexpectedly when using an information system and only returned to the client to present the final solution (*dialog* issue). In these frequent situations, the advisors failed in facilitating and explaining their tool usage activities and did not invite the clients to actively participate (*access* and *transparency* issue). In consequence, the tools and the information resources, that are used, could not become an integral part of a co-creative interaction. The clients in our study referred explicitly to the advisors' respective behavior describing that in this manner, the used tools became more of a communication barrier between them. We refer to this problem as *missing knowledge on collaborative tool usage* **(P2)** on the part of the advisors.

*Why the counseling affordances did not suffice to empower the advisors*: The technical functionalities, e.g., the tag cloud supporting the collaborative elicitation of the clients' needs (cf. Figure 4.4-2), can provide visual guidance to the participants. However, to establish co-creative interactions, both advisors and clients need to be encouraged to actively interact with the

available tools and information resources. The technical counseling affordances would have to provide corresponding instructions to both parties separately, which could easily disrupt the mutual information exchange and impede co-creative work.

#### *4.4.3.3 Missing knowledge about co-creative work processes*

In the advisory sessions' "design"-phase, all six advisors in our study revealed the same frequent behavior during all advisory sessions, both conventional and artifact-supported: Not before they had used the available information systems, e.g. the register of residence or a leaflet or a flyer, on their own to find suitable solutions, did they start to explain the solutions to the clients. In consequence, the advisors did not maintain a constant active dialog to the clients, but restricted more on concentrated information provision episodes with less of a discussion and more of a one-way monolog (*dialog* issue). With their communicative behavior, advisors furthermore hinder the clients to assess the presented solution information comprehensively (*risk assessment* issue) In the interviews, the advisors gave reasons for their behavior: They did not want to offer participation to the clients, if they could not estimate whether they would find information or not. Four advisors gave similar explanations, that without prior knowledge about the outcome of the problem-solving process, they feared they would lose control and would not be able to steer the collaboration. One advisor emphasized: "The most important thing for me was that I was the first to know a possible solution. And so I was able to steer the client's questions in the desired direction." This exemplifies, on the one hand, the advisors' traditional way of thinking as producers (referring to P1). And on the other hand, it highlights the advisors' need for specific process knowledge to perform collaborative activities: They need some in advance information about the benefits and outcome of collaborative problem-solving activities in order to perform it properly. Without this knowledge, the advisors most likely keep to their traditional work practices. We refer to this problem as *missing knowledge on co-creative work processes* **(P3)**.

*Why the counseling affordances did not suffice to empower the advisors*: The advisors could use the IT-artifact, with its problem-solving spaces (second counseling affordance) and the explicit transitions activities between them (third counseling affordance) to establish a more structured advisory process (for details see Giesbrecht et al., 2014). However, it cannot enforce an entire collaborative solution-finding process. The technical means to impose a corresponding process can have severe negative effects on the advisor-client collaboration. In actual fact, in co-creative interactions, advisors and clients in their roles as "creators" have to be able to influence the collaborative work and alter its process at all times, tailoring the final outcome.

**In summary**, citizen-advisors revealed a number of problems occurring in their current work practices regarding establishing co-creative interaction in their face-to-face advisory service encounters, which also exceeded the support provided by technical counseling affordances. We argue, that the identified problems P1 to P3 represent three of the most influential deficiencies of advisors preventing them to exert value co-creative work practices and in consequence establish value co-creation experiences for the clients. Hence, from the identified problems P1 to P3 we derive to the following three solution objectives to extend existing technical approaches in order to assist citizen-advisors in putting value co-creation into practice:

**Solution objective SO1** (addressing P1): Support the advisors in internalizing the role allocation of advisors and clients as co-creators of the advisory's value and to show the corresponding co-creative behavior during the advisory service encounter.

**Solution objective SO2** (addressing P2): Enable the advisors to use available tools and information resources as integral part of their co-creative work practices.

**Solution objective SO3** (addressing P3): Provide guidance for the advisors to decide when to apply co-creative work practices, which suit the respective phase in the advisory process and what outcome to expect from these work practices.

Advisors need to develop the corresponding skills for establishing co-creation experiences. Traditional qualification measures rarely fit the task, e.g., peer-to-peer learning, or they are too expensive because of the necessary additional teaching resources, e.g., teaching staff, or time for off-the-job training. These problems could be found within the context of citizens' services in public administrations (Giesbrecht et al., 2014, cf. 2011). However, service providers in other domains often experience similar problems, e.g., in financial advisory services (e.g. Oehler and Kohlert, 2009; Schwabe and Nussbaumer, 2009). Accordingly, service providers would benefit greatly from a cost-efficient alternative, to empower their advisors in the necessary capabilities and to reduce expensive training.

## 4.5 Service encounter thinkLets to enable value co-creation in advisory service encounters

As illustrated in the previous section, advisors need, in addition to their technical support, to learn how to establish co-creative work practices in their service encounters. The advisors' deficiencies (cf. P1 to P3) revealed their missing collaborative knowledge or more concretely their lack in facilitation skills to establish co-creative interactions in their customer service encounters.

Service providing organizations know about the importance of a high-quality IT-supported service provision as their competitive advantage and thus constantly promote training and development of the skills of their service personnel to apply corresponding information systems appropriately. In doing so, organizations most commonly arrange external off-the-job trainings with corresponding experts (cf. Artis and Harris, 2007; Cron et al., 2005). However these methods require the corresponding resources, time for off-the-job training or money for teaching staff. Furthermore, such learning episodes often take place in classrooms, are standardized, and administered by instructors who determine the content and the pace of learning. As Artis and Harris (2007) or Cron et al. (2005)

stressed in their studies, corresponding formal learning does not conform with the learning needs of service personnel for more self-directed learning. It is difficult for them to apply the learnt knowledge in their actual work environment, i.e., the IT-supported customer service encounter. Often, they are not able to embed the new methodological knowledge from off-the-job learning into their organization-specific work practices. Limited budgets and staff savings require organizations to apply methods requiring fewer resources to qualify their service personnel. Thereto, one of the most common methods in organizations are to develop scripts, which describe desired courses of action and provide the service personnel with precise instructions, like e.g., communication scripts used in call centers (cf. Deery et al., 2002; Holman, 2002; Sawyerr et al., 2009). Whereas corresponding approaches support service personnel to adapt the new knowledge in their direct customer interactions, they do hardly allow them to deviate from given instructions. In consequence, employees are not able to alter the advisory process and show the necessary flexibility to personalize the service encounter to the client's needs and preferences. Furthermore, the learning content of these approaches are mostly developed by the organization themselves, often from managers with longstanding customer service and sales experiences. As a result, aspects get transferred into the advisory service encounter that can counteract the creation of co-creative interactions: A principal-agent conflict (Eisenhardt, 1989) is likely to occur between the advisors with their incentives to sell services or products and the clients who want to be comprehensively advised and receive the optimal solution to their problem. The resulting problem of *differing goals* of advisors and clients (S. Schmidt-Rauch and Nussbaumer, 2011) can severely hamper or even prevent symmetric conversation and unrestricted information exchange in a transparent dialog, essential building blocks of co-creative interactions (Prahalad and Ramaswamy, 2004a).

The question arises how service personnel can be provided with the necessary collaboration knowledge and skills to establish an active dialog

between equal actors and ultimately to establish co-creative interactions with their clients.

### *4.5.1 The concept of thinkLets*

In the context of a branch of IS research concerned with collaborative technologies, called collaboration engineering, Briggs et al. developed the concept of *thinkLets* to provide practitioners with necessary collaboration knowledge enabling them to establish fruitful IT-supported collaboration (Briggs et al., 2003, 2001; De Vreede et al., 2006). Briggs et al. introduced the concept of thinkLets in 2001 in reaction to the often-complex nature of group support systems (Briggs et al., 2003, 2001; De Vreede et al., 2006; Kolfschoten et al., 2006). They wanted to enable the practitioners themselves, rather than expert facilitators, to induce fruitful collaboration. A thinkLet is a "named, scripted collaboration technique for predictably and repeatedly invoking known patterns of collaboration among people working together toward a goal" (Briggs et al., 2009, p. 6). It contains the intellectual capital needed for applying a known pattern of collaboration to create predictable group work behavior. Accordingly, practitioners and novice facilitators can use thinkLets as learning modules of facilitation techniques (Kolfschoten et al., 2006) and therewith enhance their facilitation skills. To enable facilitators to execute a thinkLet-based collaboration, a thinkLet provides in its physical design explicit instructions and prompts for the correspondent pattern of collaboration along with instructions how to configure and use supportive tools and technologies. Concretely, a thinkLet consist of the following principal components[6]: the name, the facilitation script, and the tools used with their configuration (Briggs et al., 2003).

***Name***: Giving the thinkLet a name enables practitioners to identify and remember the thinkLet, when applying it in their collaborations. As the

[6] When using the term „thinkLets", we refer to the physical design of a thinkLet as described in Briggs et al. (2003, 2001) or in de Vreede et al. (2006), as we mainly address the practitioners, executing the thinkLets, rather than the collaboration engineers designing them.

practitioners use it in their recurring collaborative tasks, they benefit from self-explaining or catchy names to learn the thinkLet by heart.

***Script***: The script contains an overview of the thinkLet and a set of suggested script elements. It constitutes a written recipe of everything the participants should do or say. The script provides a full set of prompts and instructions on how to perform a concrete pattern of collaboration. In doing so, it describes the behavior patterns of the participants in their roles, the rules they have to follow and the actions they have to take. In the thinkLet-concept, the script is elaborated by collaboration engineers, i.e., facilitation experts, to provide practitioners with best practices. Furthermore, they put together a sequence of thinkLets and therewith prepare the entire process of the group work. Practitioners are supposed to follow the prepared sequence and stick to the scripts of the individual thinkLets.

***Tool and Configuration***: The thinkLet describes the specific hardware and software tools needed to establish the respective pattern of collaboration. The specific technology is described that is used to afford the capabilities called for by the thinkLet. Furthermore, the thinkLet describes how the selected technologies are needed to be configured during the execution of the respective pattern of collaboration. To understand how a specific pattern of collaboration was achieved, one must know what tools were used and how they were configured.

The concept of thinkLets represents a socio-technical framework to enable non-experts facilitators to establish fruitful collaboration in group work. In the context of advisory services, the occurring collaboration between advisors and clients fit well the patterns of collaboration that emerge in group work when group members move toward a predefined goal, i.e., generate, clarify, organize, evaluate, reduce and build commitment (Briggs et al., 2009; De Vreede et al., 2006). Accordingly, thinkLets have a large potential to support advisors in the individual phases of their problem-

solving process to establish the desired co-creative interactions with their clients.

### *4.5.2 Solution: Service encounter thinkLets*

But are thinkLets, which are developed by collaboration engineers as prescriptive best practices, suitable to support advisors to learn and apply the necessary collaborative behavior in their face-to-face interaction with clients? Advisors have to align their actions and behaviors on the respective clients to provide personalized advisory service. In doing so, they need the flexibility and discretionary to adjust the problem-solving activities to the clients' individual needs. Recent research showed that support measures that hamper advisors in their efforts to customize the customer service encounter, like e.g. communication scripts used in call centers, can advance employees' role stress as well as emotional exhaustion, and ultimately impede work performance (cf. Deery et al., 2002; De Ruyter et al., 2001; Holman, 2002; Sawyerr et al., 2009). Hence, advisors applying thinkLets in their customer service encounters may struggle with its' underlying concept of predefining the collaboration's structure.

We argue, that thinkLets can be adapted to account for the advisory service encounters' special characteristics and more specific the advisors' deficiencies to establish co-creative interactions (cf. P1 to P3). Therefore, we revised the concept of thinkLets to address the solution objectives SO1 to SO3. We refer to the resulting adapted thinkLets as *service encounter thinkLets* (SET). As a result, a SET contains the following components:

***Name***: A SET, analogous as the concept of thinkLets describes, should contain a name or identifier. With the SET's name, the advisors can identify the individual service encounter thinkLet and help them to link it to the respective problem-solving activity, which they should perform in a co-creative manner (addressing SO3).

***Tools and Configuration***: Analogously to the thinkLets, the SET, together with the technical counseling affordances provided in IT-artifact, supports

advisors and clients to establish fruitful collaboration in the advisory service encounter. In doing so, an SET describes the hardware and software used to establish the SET-based collaboration and how they should be configured (addressing the technical aspect of SO2).

***Script***: Analogously to the thinkLets, the script in a SET contains an overview of the SET-induced pattern of collaboration and its goals as well as the instructions and prompts how the advisors can establish specific co-creative interactions and describes the advisors' role-related behavior. But in addition, the script in the SET needs to account for the advisors' double role as facilitators and as co-creators in the service encounter. It needs to instruct the advisors how to behave in the respective role and how and when to switch from being the facilitator, directing the advisory process from a professional position, and to become the co-creator, closely collaborating with the clients on the same level (addressing SO1). Furthermore, the script needs to provide advisors with instructions how to operate tools and information resources, i.e., the technical counseling affordances in order to make them an integral part of the co-creative interactions (addressing SO2).

***Decision Guidance***: A SET should provide the advisors with information helping them to decide which specific SET-based collaboration they should establish in the respective problem-solving activity. Whereas in the traditional thinkLet-concept, this decision information is not meant to be given to the practitioners executing a thinkLet-based collaboration, however two influential characteristics of the advisory service encounter require the advisors to receive this additional information. At first, personalization constitutes an important determinant for service quality. In this context, the advisors need to adapt and alter the advisory process for each individual client during the actual collaboration. As a result, advisors in their service encounters have to make short-term decisions about which SET-supported interaction to invoke. Secondly, the advisors in their concurrent role as facilitators as well as co-creators need to know when to stop facilitating, e.g., explaining the steps of problem-solving activities to

the client, and start establishing co-creation activities and become co-creators, e.g., when searching and discussing possible solutions with the client. To make these decisions, the SET should provide information about the concrete pattern of collaboration it is creating and which collaborative behavior and outcome is to be expected (addressing SO3).

When SETs and technical counseling affordances are provided for the individual problem-solving activities, advisors may successfully be empowered to establish co-creative interactions. The descriptive nature of service encounter thinkLets and the predictability of the resulting group behavior can help to lower the barriers for the advisors to put value co-creation into practice: The SETs can support the advisors to learn about the utilization and resulting benefits of co-creative interactions through guided execution of SET-based collaborations. Figure 4.5-1 depicts an exemplary SET for the advisory session's "intelligence"-activity, i.e., the collaborative elicitation of the clients' needs. In our instantiation, it should be used with the corresponding counseling affordance, i.e. the "problem space"-screen with its tag cloud functionality (cf. Figure 4.4-2).

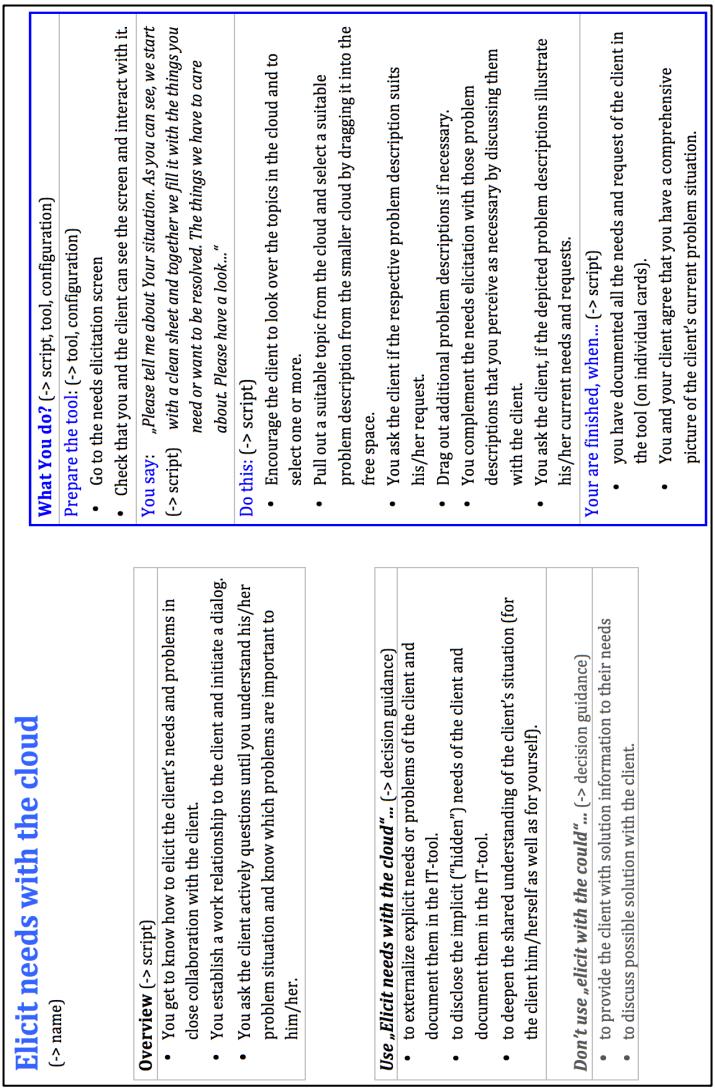


**Figure 4.5-1: Exemplary service encounter thinkLet "elicit needs with the cloud" (design adapted from the presentation of a thinkLet; Briggs et al., 2001)**

## 4.6 Evaluation

We conducted a user test to evaluate how our solution approach of SETs, combined with the technical counseling affordances, contribute to achieve the solution objectives SO1 to SO3 and, thus, empower the advisors to put value co-creation into practice. In the context of our action design science research project, we conducted the user test in the same organizational context as the first evaluation (cf. section 4.4), that is, the citizens' advisory services in the public administration's front office of the same German city.

### *4.6.1 Evaluation design*

We conducted the user test in a within-subject test design, where twelve advisors gave advice to 36 clients in 72 advisory sessions. The twelve advisors were real citizen advisors of the public administration of the same major German city, but not the same front office employees as in the problem description study. In order to have a group of participating clients analog to the first study (cf. section 4.4), they were recruited among the usual clients of the public administration from cities different from the one we worked with. Therewith, they could take on the role of new inhabitants more easily, having a similar (low) prior knowledge on city-specific administrative issues and process. The nine female and three male advisors were between 19 and 57 years old (avg.: 31.3) and the 22 female and 14 male clients were between 18 and 56 years old (avg.: 27). To evaluate whether and how our approach empowers the citizen-advisors to establish co-creative interactions, we compared their conventional advisory sessions with their "SET-supported" advisory sessions. In the conventional advisory sessions, the advisors gave advice as they normally do in their daily work. In the SET-supported advisory sessions the advisors used the counseling affordances and the SETs. Accordingly, the test was designed as follows: 1) the advisor received a refresh on the basic objectives of citizens' advisory services to ensure an equal state of knowledge among the advisors, 2) the advisors conducted a conventional advisory session. 3) In a training episode of five

hours, the advisors became acquainted with the service encounter thinkLets for the individual problem-solving activities: They read the SETs and tried them out in a role play using the IT-artifact, which provides the counseling affordances (cf. section 4.4). 4) The advisors conducted three SET-supported advisory sessions as well as three conventional advisory sessions in alternating order. Because of our test design, we could observe the differences of the advisors' advice-giving behavior as well as the advisors could give feedback on their perceived differences. Likewise, each of the clients experienced a conventional as well as a SET-supported advisory session in order to report on the differences. To assess the advisors' changing advice-giving behavior, we compared their first conventional advisory session (before the training episode) with their last SET-supported advisory session. In our action design research approach, we benefit from working and evaluating in the real organizational context (regarding external validity). Giving credit to this fact, we slightly revised the IT-tool to comply with the requests of the practitioners: The content was updated and individual components of the tool were slightly modified. However, none of the counseling affordances were substantially altered in order to assure that the IT-tool provides the same support as in the first evaluation (cf. section 4.4).

### *4.6.2 Data collection*

To evaluate the advisors during their advisory service encounters in terms of the solution objectives (SO1 to SO3), thus assessing their (non-)co-creative behavior regarding the previously identified deficiencies to put value co-creation into practice, the data collection comprised observations, interviews and a questionnaire.

First, all advisory sessions were recorded on video. These recordings were coded and analyzed by two researchers to identify and assess the advisors' work behaviors regarding to the building blocks for co-creative interactions from the DART model (Prahalad and Ramaswamy, 2004a, 2004b; see section 4.4 for detailed description): in detail, we assessed how the advisors: i) establishing an active dialog with the clients (measurement of talk time of

advisors and clients), ii) provide equal access to transparent information (identification of corresponding statements of invitation and explanation by the advisors), and iii) support clients to assess the risks and benefits of their decisions (identification of corresponding discussions of advisors and clients).

Second, semi-structured interviews were conducted with all advisors and clients to learn about the underlying reason and motivations for their behavior during the different advisory sessions Therefore, the interview guidelines consisted of questions for the perception of involvement in the value creation process, the satisfaction with the advisory service and the perception how the advisors implemented the individual building blocks for co-creative interactions form the DART model (Prahalad and Ramaswamy, 2004a). The interviews lasted, 35 minutes, on average.

Third, advisors and clients provided quantitative feedback by answering a questionnaire. To supplement the observed (changed) work behaviors and the participants' qualitative rationales, the questionnaire provides data about the participants' perception of the advisors' skills to establish co-creative work practices. Therefore, a comprehensive measuring instrument was used to assess the advisors' work-related skills. In our study, we made use of the KODEX[7] measuring instrument (Heyse and Erpenbeck, 2007; Erpenbeck and von Rosenstiel, 2007), which can be used to assess, measure and diagnose employees' work –related skills, including their professional, methodical, social/communicative, personal and activity/action-oriented skills.

[7] Originally, it was Prahalad and Hamel (1990) in the field of management who developed the concept of core competencies in organizations. In the German-speaking world, it has been the work by Erpenbeck and von Rosenstiel (2007) that has been most often used to research corresponding core competencies and their components. Heyse and Erpenbeck (2007) translated their comprehensive competence concept into the KODEX instrument to assess, measure, and diagnose personal competencies.

As the KODEX measuring instrument[8] used is very comprehensive, we will focus in this paper on the data related to the solution objectives (SO1 to SO3; cf. section 4.4). In detail, for SO1 the questionnaire contained items to assess the advisors' skills to implement the elements of the DART model: their dialog/communication skills, their media competence (knowledge and methodical skills to utilize and integrate available information sources in the advisory session), and the systematic-methodical skills to guide the clients in their assessment of risks and benefits of future decisions. For SO2, items were added to assess the advisors' particular IT-oriented knowledge and methodical skills. And for SO3, items were added to assess the methodical knowledge and the personal skills when dealing with complicated or ill-defined situations. Finally, further items comprised of the participants' perceived service quality (Yield Shift Theory; (Briggs et al., 2012), e.g. "I am satisfied with the received advisory session", their perceived relatedness (included in the IMI measuring instrument (intrinsic motivation inventory); (Deci and Ryan, 2003; McAuley et al., 1989; Ryan et al., 1983; Ryan, 1982)), e.g., "I felt close to the advisor", and their perceived involvement in the value creation process, e.g. "I felt myself involved in the creation of the result in the following advisory sessions". All items were rated on a 7-point Likert scale (7=pos. max.).

### *4.6.3 Evaluation results*

***Advisors apply co-creative work practices (addressing SO1):*** Our observations revealed that in the SET-supported advisory sessions compared to the conventional advisory sessions, the advisors could better establish co-creative work practices. The clients as well as the advisors confirmed our observations: The clients rated their involvement within the creation of the advisory's result in the SET-supported sessions significantly higher

[8] To apply the KODEX measuring instrument, the questionnaire-items for the superior competence areas need to be adapted to the respective job specifications and requirements. This was done in our study by, first, analysis of employment documents (job description, job ads, etc.) and the creation of an initial catalogue, and, finalization in an expert group consisting of two managers from the public administrations and one scholar with longstanding expertise on performance description in public administrations.

compared to the conventional sessions (5.1 in the SET-supported sessions and 4.2 in the conventional sessions; two-sided t-test, T(11)=2.411, p=0.035). In the interviews, they gave reasons for their ratings emphasizing the added value of the SET-supported advisory sessions. One client summarized: "I clearly prefer the new advisory session. I liked to be able to participate more […] the advisors integrated me actively in all steps." Also the advisors revealed that they took on their role as co-creators better (addressing SO1). According to the advisors' statement in the interviews, they changed their opinions about involving the clients fundamentally from "I don't want the client to participate and to be too close to me" after the conventional sessions to "I especially like the collaboration with the client" or "it is most important that the client is part of each activity" or even "it is fun to work with the clients that closely" after the SET-supported advisory sessions. The advisors perceived that the clients could participate significantly more in the SET-supported advisory sessions and benefit more from the co-created results (5.4 in the SET-supported sessions and 4.4 in the conventional sessions; two-sided t-test, T(11)=3.317, p=0.007). Our observations revealed that compared to the conventional advisory sessions, the advisors extended their activities in the SET-supported sessions from "just creating a basic work relationship" to actively establishing a shared understanding of themselves and the clients as co-creators. As a first evidence for that, the advisors' and clients talk time increases substantially in the SET-supported advisory sessions (71% of the total advisory session's time they talked with each other in the SET-supported sessions, in contrast to 54% in the conventional sessions). Furthermore, in the SET-supported sessions, they provided elaborate explanations (regarding information or activities they provided or performed) and invited the clients verbally more often to participate actively in the advisory session compared to the conventional sessions (on average, a advisor made eight explanatory statements and invited the client four times to participate in the SET-supported advisory sessions, and made only two explanatory statements and none invitations in the conventional sessions). In the interviews, the advisors gave reasons for their behavior emphasizing their ability to establish a more efficient collaboration. One advisor stated: "I

liked the close collaboration with the clients […] discussing about the problems and solutions […] they comprehend faster and we could work more efficiently." The clients also reflect the advisors' changing behavior in the service encounter in their assessment of the advisors' skills. They value the advisors' dialog and communication skills substantially higher in the SET-supported advisory sessions then in the conventional ones (6.2 in the SET-supported advisory sessions and 5.7 in the conventional sessions; significant difference, two-sided t-test, $T(35)=2.14$, $p=0.04$). Finally, the clients also perceive that in the SET-supported advisory sessions, the advisors are significantly better able to support them in assessing the risks associated with the decision they took (5.6 in the SET-supported advisory sessions, 5.2 in the conventional sessions; significant difference, two-sided t-test, $T(35)=2.27$ , $p= 0.03$).

***Collaborative use of tools and information resources (addressing SO2)*:** Our observations revealed that in the SET-supported advisory sessions, eleven out of twelve advisors actively used the available IT-tool in collaboration with their clients. The advisors gave reasons in the interviews emphasizing the benefits of integrating the clients in the usage of the tools. One advisor stated: "It is much better to integrate him [the client] in the usage of the tool […] he becomes more active and participates much more." And another one summarized: "[...] with giving the clients the more access to the information in the IT-tool, they participated more actively in the advisory session and got more interested […], therefore I always used it together with them." The advisors' changed IT usage behavior was also reflected in the clients' assessment of the advisors' skills. They value the advisors' knowledge and methodical skills to apply available IT and other media appropriately in the advisor-client-interactions significantly higher after the SET-supported advisory sessions (6.1 in the SET-supported advisory sessions, but only 5.3 in the conventional sessions; significant difference, two-sided t-test, $T(35)=3.329$, $p=0.002$). However, despite the advisors' statements on the positive effects of collaborative tool usage, ten of the twelve advisors in the test did not show any collaborative tool usage behavior in the conventional sessions. In the interviews, they gave reasons stating, for instance, that they

"would not know how to integrate the client" or "it didn't occur to me to integrate the client in the usage of the tool".

***Knowing when and how to initiate co-creation activities (addressing SO3):*** The biggest change in the advisors' behavior appeared in their active customization of the advisory process regarding the specific needs of the clients. Our observations revealed that all twelve advisors started to facilitate the advisory process more actively: Whereas in the conventional advisory sessions, where the advisors limited themselves to reactively answering the clients' direct questions, they started to proactively asking questions in the SET-supported sessions. In doing so, the advisors established a more active dialog and directed the advisory process more purposefully. Our observations were also confirmed by the clients' feedback: They valued the advisors' methodical skills to adapt the advisory process to their preferences in the SET-supported advisory sessions significantly higher (5.6 in the SET-supported sessions, 5.2 in the conventional sessions; significant difference, two-sided t-test, $T(35)= 2.11$, $p=0.04$). The advisors initiated distinct problem-solving activities integrating the clients in a co-creative manner in the individual activity (addressing SO3). Accordingly, the clients rated their involvement in the value creation process in the SET-supported sessions significantly higher then in the conventional ones (see results above; 5.1 in the SET-supported sessions and 4.2 in the conventional sessions). In this context, the clients perceived the results from the advisory session as significantly more comprehensible (5.1 in the SET-supported and 4.57 in the conventional sessions; significant difference, two-sided t-test, $T(11)=3.823$, $p=0.003$). The advisors gave reasons for their behavior referring to the predictability of the SETs. In fact, they appreciated "knowing what to expect when following the script [of a SET]" or "knowing how to handle the IT-tool within the collaboration as described in the SET".

***Promising approach to empower advisors to put value co-creation into practice:*** The clients were substantially more satisfied with the advisory service in the SET-supported session compared to the conventional session (6.1 in the SET-supported sessions, and only 5.5 in the conventional sessions;

significant difference, two-sided t-test, T(35)=2.08, p=0.045). But also the advisors rated their satisfaction significantly higher in their SET-supported advisory session than in the conventional ones (5.5 in the SET-supported sessions and 4.4 in the conventional sessions; significant difference, two-sided t-test, T(11)=2.82, p=0.017). Furthermore, they felt more competent in providing a sound advisory service (5.6 in the SET-supported sessions and 5.1 in the conventional sessions) and in having a considerably higher impact on the clients (5.5 in the SET-supported sessions and only 4.4 in the conventional sessions; significant difference, two-sided t-test, T(11)=2.862, p=0.015).

## 4.7 Discussion

The evaluation showed that both the technical counseling affordances and the SETs are needed to empower advisors effectively to implement the building blocks for establishing co-creative interactions from the DART model (Prahalad and Ramaswamy, 2004a, 2004b) and ultimately create co-creation experiences for their clients. The technical counseling affordances, e.g., "offer collaboration material and corresponding tools", provide opportunities for co-creation, however, advisors have to show corresponding collaborative behavior to enable the creation of actual value co-creation experiences. When the advisors lack this collaborative behavior, co-creation is prevented. This illustrates an example from a conventional advisory session observed: When the advisor searched for solution on her desktop computer, the interested client bended forward to have a closer look at the information on the screen. However, as the advisor did not explain her actions or invited him verbally to collaborate, he leaned back and waited for the advisor to explain the final solution to him, i.e., going back into the role as passive consumer. In this context, information systems equipped with a combination of SETs and technical counseling affordances can support the advisors effectively to show the necessary collaborative behavior, integrating the technical counseling affordances as an integral part of co-creative

interactions, creating a "co-creative service encounter" (COSE). Accordingly, we call it the COSE-framework.

Figure 4.7-1 depicts the COSE-framework, providing SETs together with technical counseling affordances, empowering advisors to apply co-creative work practices in advisory service encounters. For the individual problem-solving activities in the service encounter, the combination of technical counseling affordances and corresponding SETs supports the advisors in creating co-creative interactions. In an individual problem-solving activity, multiple SETs can be provided to the advisors allowing them to decide which SET to apply and thus adapt the problem-solving activities on the respective client and his or her special needs and preferences.

Applying the COSE-framework, advisors are encouraged to take on their concurrent role as co-creators in and facilitators of the advisory service encounter, promoting co-creation experiences. However, the test revealed that without an initial "setup" of the co-creative work relationship between advisors and clients, the actors frequently remained within the traditional role allocation of producer and consumer, preventing co-creation experiences to occur. In line with Payne et al. (2008), we argue that the advisors need to actively manage the co-creation of value. In the service encounter, this needs to be started with the initiation of a co-creative work environment. Therein, the advisors should actively establish a close work relationship with the clients and ensure a shared understanding of the clients' and their own roles as co-creators with equal rights and duties. Simon's (1987) rational problem-solving process does not directly account for these relationship-building issues incorporated in value co-creation. Thus the "initiation of co-creation" constitutes an important first activity in the co-creative advisory service encounter before the problem-solving process – with "intelligence", "design", and "choice" – starts (cf. the different advisory encounter phases in Figure 4.7-1).

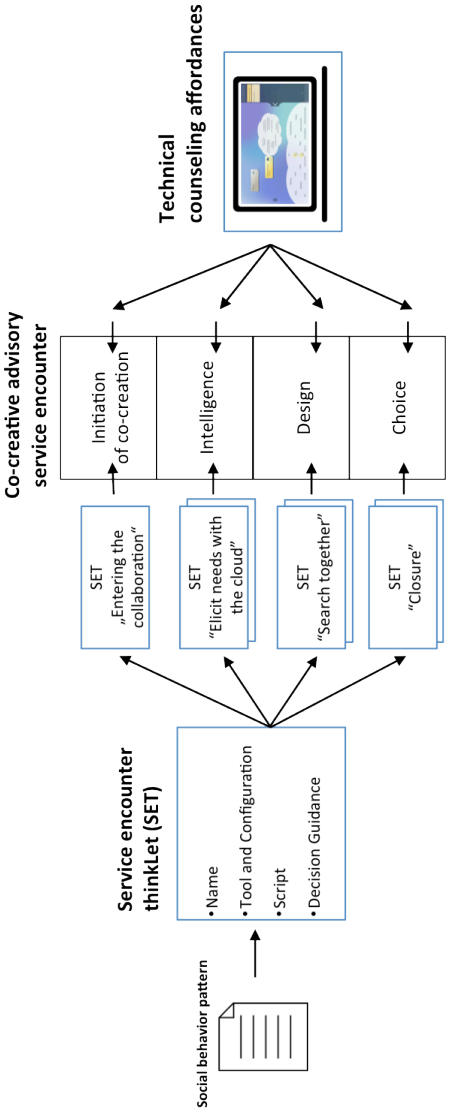


**Figure 4.7-1: The COSE-framework to establish co-creative advisory service encounters**

Designing and deploying (socio-technical!) information systems implementing the COSE-framework constitutes an efficient instrument to enable advisors to diminish their current deficiencies regarding co-creative work practices (cf. P1 to P3) and, in consequence, to put value co-creation into practice (addressing the research questions). With a training episode of only about one day, advisors could implement the abstract concept of value co-creation and establish co-creation experiences for their clients in their advisory service encounters. Hence, they accomplished the shift from product-centric service provision to creating personalized service experiences for the clients as Prahalad and Ramaswamy (2004a) call for in their work.

The COSE-framework provides a scaffold enabling the advisors to effectively apply co-creative work practices in their advisory service encounters. In other words, the combination of SETs and technical counseling affordances provide the advisors with the necessary tools, information and behavioral instructions to establish individualized co-creation experiences. Our evaluation revealed the necessity of this scaffold: In the SET-supported advisory sessions all twelve advisors successfully established co-creation interactions, implementing the elements of the DART model (Prahalad and Ramaswamy, 2004a). However in the conventional advisory sessions, only one out of twelve advisors was able to establish similar co-creation interactions. The advisors' "loss" of collaborative behavior in the conventional advisory sessions emphasizes the benefit (and necessity) of the combination of SETs and technical counseling affordances in supporting them: Without the constant "offerings" from the counseling affordances, mere behavioral guidelines are not adequately present and the advisors were substantially less capable of implementing co-creative work practices. "The COSE-framework as scaffold" shows what large effect appropriately designed information system support in service encounters can have on value co-creation, or specifically its implementation in practice. It emphasizes the importance of constant support, which in turn helping service personnel to limit the cognitive workload when implementing novel

co-creative work practices. Hence, we argue that current frameworks, describing the processes and practices of designing for co-creative interactions in client-supplier encounters, as e.g. described by Payne et al. (2008) or Grönroos and Voima (2013), can be augmented by extending them with our design knowledge on corresponding support processes and practices.

With introducing the COSE-framework, we furthermore contribute to ongoing IS research discourse on designing IT-systems supporting advisory service encounters. The framework provide guidance for IS researchers like, e.g., Rodden et al. (2003), Nussbaumer et al. (2012), Kira et al. (2009), Novak (2009) or Schmidt-Rauch and Schwabe (2014, 2011), to comprehensively document and characterize their developed and deployed IS-solution, allowing them to complement their artifact design knowledge contribution to the knowledge base. That is, alongside describing technical design principles for their socio-technical IS-solutions, researchers can benefit from the COSE-framework and systematically communicate the social interaction patterns making their deployed IS-solution a success. Furthermore, IS researchers can use the COSE-framework for helping them deploying future IS-solutions more successfully in advisor-client-collaborations: We highlight how the introduction of IT-artifacts within advisory service encounters can be complemented with suitable social behavioral guidelines to support making them an integral part of co-creative interactions and ultimately helping advisors to establish actual co-creation experiences, enhancing the quality of the advisory service encounter.

With introducing the concept of service encounter thinkLets, we could demonstrate how the concept of thinkLets can successfully be transferred from their traditional field of application of large groups to the dyadic collaboration in customer service encounters. We thereby want to contribute to the IS discourses on collaboration engineering from Briggs et al. (2009, 2003, 2001), De Vreede et al. (2006), or Kolfschoten et al. (2006) by highlighting the refinements of the thinkLet concept for successful application in service encounters, where facilitators (i.e., the advisors) have

to get empowered to design their own collaborations more autonomously than originally planned. In applying concepts of collaboration engineering to service encounters, practitioners in service providing organizations can systematically improve and document customer service encounters, making them true co-creation experiences, with advisors and clients collaborating more effectively.

The qualification aspects in the COSE-framework address and diminish deficiencies of current methods to train and qualify service personnel. In contrast to the provision and application of scripts in service personnel's training (e.g., Holman, 2002; Leigh, 1987), the developed SETs provide advisors with a repertory of co-creative work practices rather then pre-structuring the advisory dialog and purporting a rigid advisory process. The SETs comprise specific guiding information to enable advisors to decide for themselves when to apply a corresponding SET in the current problem-solving activity and ultimately alter the advisory session's process at any time (cf. "decision guidance" element of an SET). Therewith, we argue, that the negative effects of standard communication scripts on the provision of personalized service could be prevented. Furthermore, the developed COSE-framework shows how collaboration knowledge and practices could effectively be transferred from external, often more formal, learning and training methods, like, e.g., off-the-job training, into the actual service encounter. In this context, the support from the SETs together with technical counseling affordances provides suitable means to create educational opportunities for more self-directed learning, which suits more service personnel's learning needs, as Cron et al. (2005) or Artis and Harris (2007) call for in their studies. With the insights of the COSE-framework's application, researchers can deepen their understanding of learning behavior of service personnel and more detailed on the effects of appropriately designed on-the-job support on empowerment, job satisfaction and work performance. Managers responsible for service personnel's training and learning can benefit and use the COSE-framework to enhance existing concepts effectiveness to transfer knowledge and skills where it matters, into

the actual customer service encounter. We therewith also answer Prahalad and Ramaswamy's call for "socializing managers and changing managerial practices" to establish value co-creation experiences (Prahalad and Ramaswamy, 2004a, p. 13).

In bringing together the technical counseling affordances and the SETs in the COSE-framework (cf. Figure 4.7-1), a socio-technical framework is constituted, which is of high benefit for all the stakeholders involved, namely the service personnel (=advisors), the clients and the service provider. The advisors are comprehensively supported to apply co-creative work practices and to make appropriate use of the supportive IT-artifacts. With the help of SETs, the advisors get encouraged to explicitly initiate a co-creative work environment, a crucial precondition to transform co-creation opportunities into co-creation experiences for the clients. With the SETs supplemented by the offerings of the counseling affordances, we could show how service personnel can successfully be supported in their dual role as domain expert and facilitator in advisory service encounters. Providing service personnel with the SETs' decision guidance – in contrast to traditional thinkLets – allow them to (re-)gain the autonomy and flexibility to customize the advisory service encounter and establishing personalized co-creation experiences for the clients. In doing so, the COSE-framework helps to diminish deficiencies of current qualification and training approaches, like e.g., role conflict issues when using script-based support. In turn, the clients in advisory sessions supported by SETs and counseling affordances perceived themselves more as co-creators of the advisory's result and increased their satisfaction with and commitment to the advisory results substantially. The service provider benefits because the COSE-framework, in the sense of a scaffold containing tools, techniques, information and behavioral instructions, enables service agents to take on their role as professional advisors. Therewith, it may constitute suitable means for quality management and support service providers to reduce the costs to qualify their service personnel and concurrently establish a more consistent service quality. Furthermore, the COSE-framework can guide developers of future IT-artifacts supporting actors in their service encounters

to enhance their systems' design and improve the systems' appropriation by service personnel.

## 4.8 Conclusion

In this paper, we discussed the concept of value co-creation from a "service encounter"-perspective addressing the conceptual-practical gap appearing in the current scientific discussion in information systems research and on service systems: how to enable service agents to put value co-creation into practice within their IT-supported service encounters. Integrated in an action design research project, we situated our discussions in the organizational context of citizens' advisory services, as they constitute a prime example for co-creative service encounter.

Whereas technical counseling affordances constitute appropriate means to support advisors enhancing their basic advice-giving behavior, technical support reaches their limits when advisors reveal their fundamental deficiencies regarding co-creative work practices (cf. P1 to P3 in section 4.4). These deficiencies hamper advisors severely to make appropriate use of provided IT-support and accessing its capabilities to provide co-creation opportunities. We argued, that they need social behavioral instructions how to establish co-creative interactions and introduced the concept of *service encounter thinkLets (SETs)*. We made use of the collaboration engineering's concept of thinkLets (Briggs et al., 2003, 2001; Kolfschoten et al., 2006), designed to provide novice facilitators with behavioral instructions to establish fruitful collaborations in group work, and could adapt it on the domain of service encounters. The resulting SETs account for the characteristics of advisors in their IT-supported advisory service encounters: SETs provide specific decision guidance for the advisors to empower them to customize and personalize the IT-supported service encounter autonomously. The SETs account strongly for the advisors' concurrent role as facilitators and as co-creators by providing sufficient instructions about role transitions and the initiation of individual co-creation activities. We

refer to the combination of technical counseling affordances and SETs as the COSE-framework.

The presented COSE-framework is based on the generic problem-solving process from Simon (1987) and the broadly applicable concept of thinkLets from collaboration engineering. Therefore we argue that our findings can be transferred from citizens' advisory services to similar service encounters in other service domains, e.g., financial advisory services or advisory services in travel agencies. In fact, first research efforts revealed similar problems in financial as well as travel advisory services. To strengthen further the applicability of the COSE-framework, future research needs to systematically identify the deficiencies of advisors in other service domains. Additionally, this helps to gain further insight on how the SETs help to resolve these deficiencies and thus leading to a better service encounter.

While working in a real-world context with actual front office employees allowed us deep insights, our research approach also comes with limitations. The evaluation with actual front office employees could only be done in a shorter-period test setting over six days. Accordingly, we could not make final statements about advisor's appropriation of the provided support resources and organizational integration. In this context, at time of this writing, a longer-period pilot test is running to gather deeper insights in the COSE-framework's effects on the service agent's co-creative behavior in their service encounters.

# 5 TRANSFORMING THE GOVERNMENT SERVICE PARADIGM: READYING EMPLOYEES FOR CITIZEN-CENTRIC SERVICES

Research essay IV[9]


***Abstract***

*So far, government front offices have mainly provided transaction-oriented processing services. However, in recent years citizens' expectations have raised and are demanding more citizen-centric and individually tailored services including advisory services. Yet, front office employees, since they were mostly transferred from back offices to front offices without any additional training, have difficulty meeting these expanded expectations. They frequently lack subject matter expertise as well as necessary skills to meet the service demands. For addressing this problem, government front office employees need additional training and a work environment that enables them to offer true citizen-centric advisory services. While concepts, influencing factors, or impediments that enable transformational change were extensively discussed for back offices in e-Government research, the physical front offices with their service-providing employees have been frequently omitted from such study. Given the severe time-, cost-, and personnel-related constraints, the change of structures and practices in government front offices presents a serious challenge; however, it nonetheless appears fundamental to governments' modernization. In this paper, we discuss how government front offices can transform from administering government-centric, transaction-oriented services to also providing tailor-made citizen-centric advisory services. We demonstrate that by means of assistive and advisory information artifacts government front-office employees can become expert advisors and eventually provide citizens with superior advisory services. We found that appropriately designed advisory information artifacts have the capacity to effectively support public front-office employees in*


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*acquiring the necessary advisory-related skills while concurrently providing superior customer-oriented advisory services.*

## 5.1 Introduction

As one of their core tasks, local governments have to provide citizens with services and give advice to them in their front offices (Bogumil and Jann, 2008; Lenk et al., 1990). Today's citizens perceive themselves more as clients then petitioners of the government and correspondingly increase their expectations on service quality (Schedler and Proeller, 2000). They start comparing public with private-sector services and expect the adoption of corresponding concepts, for example, "customer-orientation" or "one face to the customer". When entering a novel life circumstance, for example, moving into a new town, citizens expect sound, comprehensive advice from local governments' employees to resolve their government-related issues, for example, tax questions, possibilities for financial aid, or information on public health services. Current practices, though, rather show that citizens need to take a "rally" from department to department in order to learn about and finally resolve their government-related issues (Schedler and Proeller, 2000; Schenk and Schwabe, 2011). And employees in the individual department with their specialist knowledge on specific governmental topics are rarely able to provide the comprehensive advisory service these citizens.

In response, local governments started to rethink their service offers, which build upon the separated information and service resources in their silo-structured back office. With developing and introducing novel information and communication technologies (ICT), they established integrated knowledge bases providing information-seeking citizens access on various levels through an increasing offer of online services on local governments' web presences (Kubicek and Hagen, 2000; Layne and Lee, 2001; Reffat, 2003; Torres et al., 2005; United Nations and Department of Economic and Social Affairs, 2014; Wimmer, 2002). However, while citizens therewith can satisfy simple information needs or conduct standard transactions, citizens with

more complex requests can rarely resolve their government-related issues (Giesbrecht et al., 2014): Citizens entering a novel life circumstances often need comprehensive personal advice as due to insufficient domain knowledge, they often cannot express their actual information needs (also called *anomalous state of knowledge*, (Belkin et al., 1982). Accordingly, without knowing what to look or search for, citizens are not capable of making use of online information or self-services in governments' Internet presences. They mostly are in need of a human advisor helping them uncover their actual needs and eventually translate these into governmental terminology, for example, in an intensive verbal exchange.

In consequence, citizens seek face-to-face advice in the standardized contact points offered by local government in their physical front offices (also known as "neighborhood service centers," "Bürgerbüros", or "citizen advice bureaux") (Lenk, 2002, 1998). However, today's front offices are rarely prepared to provide tailored advisory services, as work environment and work culture are aligned with processing requests from citizens as petitioners (Lenk and Klee-Kruse, 2000; Schenk and Schwabe, 2011), for example, renew a passport. We argue, that local governments need to focus their modernization efforts on their front offices, adapt current work processes and establish appropriate work environment to enable them to keep up with citizens' rising expectations on service quality and provide true citizen-centric advisory services. Current research extensively discusses the basic needs for transformational change in local governments' back and front office required to improve service provision (cf. Davison et al., 2005; Irani et al., 2007; King and Cotterill, 2007; Weerakkody et al., 2008). They describe basic aspects, challenges and key factors (Weerakkody et al., 2011, 2008) or impediments (Veenstra et al., 2011) influencing transformational change, for example, lacking leadership, employees' resistance to change, lack of coordination and collaboration, or silo-ed organizational structure. However, current studies mostly focus on transformation and improvement of online services and rarely provide insights on the physical front offices. In consequence, they do not address elements that can strongly influence

successful transformational change, for example, the physical workspace, the service-providing employees or their work-related capabilities.

This leads us to the first research question (**RQ1**): *How can front offices be transformed to offer true advisory services*?

Employees in the front offices are advice-seeking citizens' first and main contact to resolve their government-related issues. Accordingly, their advisory-related skills and their work performances play a crucial role in transforming front office service provision, namely changing from providing transaction-oriented processing to sound and true advisory services. However, whereas front-office employees in private service organizations, for example, in a travel agency or in governmental departments offering explicit advisory services, for example, social welfare or tax office, are often well-trained to provide sound advisory services, front offices' employees frequently lack the necessary qualification (cf. section 5.2 for details). Employees in front offices mostly are transferred from their back office administrative tasks into the front office. And in consequence, they often just possess knowledge about the governmental department, which they originate from (Lenk and Klee-Kruse, 2000; Schenk and Schwabe, 2011) and thus lack the necessary cross-departmental overview of the governmental information and services. Furthermore, organizational support for coping with the organizations' increasing offers of integrated services is often lacking (Schenk and Schwabe, 2011). That is, employees are rarely provided with customized auxiliary means (Lenk and Klee-Kruse, 2000) or have rarely the necessary resources for additional training (time for off-the-job training, money for teaching staff) (Lenk and Schuppan, 2011; Valenduc et al., 2007). Suitable qualification is a fundamental measure for supporting or enabling transformation, as different studies showing the negative effects of employees' lacking skills (Veenstra et al., 2011; Weerakkody et al., 2012, 2008). In consequence, the comprehensiveness and quality of advisory service in today's front offices depends on the individual capability of the respective employee and thus can vary greatly, causing citizens to be rather dissatisfied with current citizen service provision (Accenture, 2005; J.

Fountain, 2001; Schedler and Proeller, 2000; United Nations and Department of Economic and Social Affairs, 2014).

This leads to the second research question (**RQ2**): *How can front offices' employees be empowered to offer true advisory services*?

To answer the two research questions, we report from an action design research study within the front offices of a major German city. We argue that in front offices' organizational environment, employees need suitable support to learn and apply the skills for providing citizen-centric true advisory service, where communicative and interpersonal skills gain importance rather then having specialist knowledge on particular governmental topics (Lenk, 1998; Schuppan, 2010; Valenduc et al., 2007). Therefore, we present a socio-technical framework for helping to empower front-office employees to provide sound, comprehensive advisory service to citizens. Thereby, we built on our previous publications (Giesbrecht et al., 2015a; Giesbrecht and Schwabe, 2015) wherein the technical development of the framework's individual components is described. In this paper, we focus on analyzing its organizational effects at the workplace and how it can support transformational change. In this context, additional data is presented. Following our action design science research approach, we first review related research literature on advisory service provision and employees' skills in local government front offices in section 5.2. We thereby highlight the occurring qualification challenges in today's front offices and emphasize corresponding research gaps. In section 5.3, we describe our research approach including evaluation design and data collection methods. In section 5.4, we introduce our solution approach and introduce the concept of an *advisory information artifact*. In section 5.5, we report on the evaluation of our solution approach in the work context of a local government front office of a major German city, highlighting effects and effectiveness of our solution. In section 5.6, we discuss our findings and its implications for research and practice.

## 5.2 Problem specification: Services, qualifications, and information artifacts in local-government front offices

Providing sound citizen advisory services require local-government front offices to provide corresponding work environment and having suitably qualified service personnel. This section provides background regarding these aspects and points to the gaps of current approach from research and practice.

### *5.2.1 Service provision in government front offices and the necessity for change*

In their neighborhood centers and front offices governments offer citizens services on the municipal level that require personal appearance like, for example, registration of residency or passport renewal (Lenk and Klee-Kruse, 2000). In these transactions citizens appear more like petitioners, while government employees act as grantors and administrators who process the transactions or provide. Consequently, front office workspaces and their information systems are designed to enable and process transactions (Schenk, 2014) with a focus on governmental requirements and on effective processing rather than on a citizen-centric, advisory, and comprehensive service delivery (Giesbrecht et al., 2014) that modern governments are expected to establish (Denhardt and Denhardt, 2000; Lenk, 2002; Schedler and Proeller, 2000; Schuppan and Reichard, 2002; Weerakkody et al., 2008). In consequence, citizens are frequently dissatisfied with front office service provision (Accenture, 2005; J. Fountain, 2001; Schedler and Proeller, 2000; United Nations and Department of Economic and Social Affairs, 2014), not least because visits to government offices frequently lead into a long march from one government department (Schedler and Proeller, 2000) to the next before the citizen's service request is ultimately completed.

For some time, it has been advocated that in their front offices local governments should change their service paradigm and adapt work processes and structures that provide truly citizen-centric and advisory services rather than administration-centric and transactional services only (Davison et al., 2005; King and Cotterill, 2007; Veenstra et al., 2011; Weerakkody et al., 2011, 2008). Extensive changes in processes and structures are considered necessary to enable e-Government initiatives to take full effect and advantage of the benefits of ICT-supported work practices (Gregor et al., 2006; Veenstra et al., 2011). Transformational changes in local governments' back and front offices have been described as ways to establish citizen-centric services (Gupta and Jana, 2003; King and Cotterill, 2007; Hans J Scholl, 2005; Hans J. Scholl, 2005; Scholl et al., 2012; Veenstra et al., 2011; Weerakkody et al., 2008). Weerakkody et al. (2008), for instance, describe key factors influencing transformational change, for example, training incentives and supporting their change efforts, seeing IT as enabler of citizen-centric services, or breaking down of the silo mentality in local authorities. Or, Veenstra et al. (2011) highlight impediments for successful transformational changes, for example, lack of IT skills or lack of coordination and collaboration. However, current research approaches mostly focus on transformational change to develop or improve online service delivery, and rarely provide practical insights on how local governments' physical front offices can transform to provide citizen-centric services. The important role of government employees and their individual capabilities to provide services or the physical service environment as a key factor have so far mostly been neglected in research.

### *5.2.2 Necessary skill sets for providing true advisory services*

In personal life situations such as moving into a new municipality, citizens have a need to know about available governmental services, for example, about public schools, parking permits, or financial aid, and its eligibility in the specific situation. Accordingly, government front-office employees are confronted with a multitude of potential service requests, which they have to

understand and be able to support. Furthermore, the problem space at hand, with which citizens are confronted, can be rather diffuse. As a consequence, mapping the citizen's problem space onto suitable solutions, that is, matching available governmental information and services to needs, can be demanding, and front-office employees can only rely on little (if any) support beyond their verbal dialogue. Thus, communication and interpersonal skills gain importance, and employees' social skills and their understanding for interrelations and connections become even more essential than their expert knowledge regarding individual governmental services (Lenk and Klee-Kruse, 2000).

In these face-to-face service encounters, front-office employees need to extend their set of skills from one of administrators processing standard transactions to one of advisors providing comprehensive advisory services. Originating in psychology, advisory services' principal objective is to enable advice-seeking clients to resolve their problems on their own (Schwartzer and Posse, 1986; Warschburger, 2009) and thereby provide them with sufficient decision guidance for dealing with their own problems. In an advisory service encounter, advisors and clients both have to provide distinct information and have to actively participate in the collaboration to develop solutions (the advisor's area of expertise) that suit the client's problems (the client's area of expertise). Thereby, advisors and clients follow a distinct problem-solving process (cf. Giesbrecht et al., 2011; Lenk, 1998; Mutzeck, 2008; Schenk and Schwabe, 2011; Susanne Schmidt-Rauch and Nussbaumer, 2011; Simon et al., 1987) consisting of a fact-finding intelligence phase, a design phase, and a choice phase: In the initial intelligence phase (also referred to as needs elicitation phase), advisors and clients together explore the clients' problems and needs in order to create a thorough understanding of the client's situation. In the subsequent design and choice phase (also called solution-finding phase), advisors make suitable use of available tools and information resources to search for solutions for each problem and handing them over to their clients.

A number of researchers recognized and discussed the extended skills that employees, working in public front offices, need to provide true advisory services to citizens (Giesbrecht et al., 2014; Lenk, 2002, 1998; Lenk and Klee-Kruse, 2000; Lenk and Schuppan, 2011; Schenk and Schwabe, 2011; Valenduc et al., 2007). Whereas the descriptions of the necessary skills partly differ, they converge with regard to the skill sets of facilitation and mediation, which front-office employees have to be versed in when providing citizen-centric services. In detail, front-office employees are to possess the necessary professional and methodological knowledge as well as social and personal skills to (i) guide their clients through a structured problem-process, (ii) suitably apply available tools and information resources within this process, and (iii) establish and maintain a close relationship to the clients (Giesbrecht et al., 2015a).

### *5.2.3 Why front-office employees still lack the necessary skills*

Different studies show that employees in government front offices frequently lack the necessary skills to provide the desired levels of citizen-centric advisory services (cf. Andersen, 2006; Giesbrecht et al., 2015a, 2011; Hielscher and Ochs, 2009; Schenk and Schwabe, 2011). As reported in Giesbrecht et al. (2015a), front-office employees show distinct deficiencies in their current work practices: (i) Instead of guiding the client through a structured process, they merely respond to clients' direct questions. Thereby, they pass the conversational lead to the clients and have substantially less control about the service encounter and its outcome; (ii): Front-office employees currently make only little use of available information resources, neither paper-based nor electronic. They merely hand over standard information, for example, by giving out standardized leaflets or brochures to citizens rather than providing tailored information or explain procedures to citizens. As a consequence, standardized information resources rather act as communication barriers between front-office employees and citizens and therewith can compromise the service quality. Still, government employees confine their communications and interactions

with citizens to collecting the specific request at the beginning of the service encounter and at the end to providing citizens with information on the solution; however, while processing the request and searching for information on suitable solutions, they rarely interact with the advice- and service-seeking citizen.

Providing citizen-centric advisory services requires government employees to master a multitude of additional skills compared to their tasks as administrators. However, front-office employees are rarely prepared for this more comprehensive set of tasks. Their vocational training foremost focuses on transferring legal knowledge and proficiency in administrative processes, and developing social skills or citizen-centric work behaviors is often lacking (Kaiser, 2004; Lenk and Klee-Kruse, 2000). Furthermore, in daily routine work, organizational support to cope with the extended service tasks are missing (Lenk and Klee-Kruse, 2000; Schenk and Schwabe, 2011). Training resources are restricted, as time for off-the-job training is lacking, funding for qualified instructors is inadequate (Kaiser, 2004; Lenk and Schuppan, 2011), or instructional methods such as mentoring, shadowing or other learning-from-others approaches are found ill-suited for communicating novel work practices (Giesbrecht et al., 2014). Consequently, government employees, when assigned to serve in front offices, rarely possess the skills necessary for providing sound advisory services and barely have the chance to develop them on the job. While research has uncovered and addressed several educational deficiencies (Kaiser, 2004; Lenk and Klee-Kruse, 2000) and has also outlined the basic skills, which government employees in a modernized public administration should possess (Hummel and Krcmar, 2003; Leitner, 2006; Schenk and Schwabe, 2011; Schuppan, 2010), few practical suggestions have been made on how front-office employees could actually develop these skills.

Public employees are often transferred from their back office workplaces into front offices without any additional training (Lenk and Klee-Kruse, 2000; Schenk and Schwabe, 2011). As a result, they are mostly accustomed to back office work practices with structured processing of specific requests

within a particular governmental department. Thus, these employees lack expertise in effective front office service provision, since citizen-centered advising can be less structured and requires mastering communicative and interpersonal skills from the employees rather than sticking to well-structured administrative tasks as in the back office. Assuming and "living" a front office service-oriented mentality and accepting the role of advisors is further complicated and undermined by employees' perception of front-office activities being lower in value and ranking than back office activities (Weerakkody et al., 2011).

### *5.2.4 The role of information artifacts in service provision*

For some time, commercial service providers have pioneered the use of, in particular, mobile information artifacts such as electronic notepads, light laptops, and other mobile devices with specialized applications to assist in service provisioning and sales (Balasubraman et al., 2002; Belardini, 2013; Shankar et al., 2010). The concept of an "information artifact" has been introduced as a summary term, which encompasses "both sources and pieces of information as well as information systems and other information technology artifacts. This recognizes the fact that information in its various forms and formats and its technology instantiation on the various levels can no longer meaningfully be distinguished" (Scholl and Carlson, 2012, p. 141). Information artifacts, mobile or stationary, might have the capacity to effectively also assist in government service provision (Giesbrecht et al., 2014; Schenk and Schwabe, 2011). In particular, the aforementioned lack of skills on part of government employees when servicing citizens might be an area, where information artifacts can play an important assistive role (Giesbrecht et al., 2014).

In this paper, we address these research gaps and want to show how government front offices can transform to offering comprehensive citizen-centric advisory services (RQ1) and more specifically how employees in government front offices can be instructed and supported to consistently provide sound and comprehensive advisory services (RQ2).

## 5.3 Methodology

To address the research questions, we employed an action design research approach. Sein et al. (2011) describe the individual activities that an action design research project comprises: (I.) problem formulation, (II.) building, intervention and evaluation, (III.) reflection and learning, and (IV.) formalization of learning. This approach promotes a close partnership between researchers and practitioners, and it therewith suited our research environment well when working in close collaboration with the local government of a major German city. With our research, we also wanted to respond to van de Ven and Johnson's call to "not only enhance the relevance of research for practice but also contribute significantly to advancing research knowledge" (Van de Ven and Johnson, 2006, p. 802). Action design research (or action research with a design focus) is frequently applied in e-Government research (cf. Gong and Janssen, 2012; Papas et al., 2012; Saebø et al., 2011, 2008). When following an action design research approach researchers can also extend their observational role within a case study by introducing a specific intervention and then observe its effects to gain deeper insights regarding the (transformational) effects of ICT on work practices in government. Below we address the stages of our action design research as follows:

***Problem specification*** *(addressing I.):* We discuss the current state of research knowledge regarding service provision and employees' qualification in local government front offices. In section 5.2, we justify the research questions and highlight related gaps in current research.

***Solution approach*** *(addressing II. building):* We describe our solution approach of developing an *advisory information artifact* supporting transformational changes in front-office service provision. We introduce the main components that our solution approach is based upon: *counseling affordances* and *service encounter thinkLets* (SETs). Thereby, the technical development of counseling affordances and SETs are discussed in previous publications (cf. Giesbrecht et al., 2015a; Giesbrecht and Schwabe, 2015). In

this paper, we view the design and application of advisory information artifacts from an organizational perspective. By so doing, we focus on transformational change in face-to-face citizen services and on the ways transformational changes can be supported by ICTs and advisory information artifacts.

***Findings*** *(addressing II. intervention and evaluation):* In a research collaboration with the local government of a German city, we implemented our solution approach, an advisory information artifact supporting the empowerment of front-office employees in becoming actual advisors provide citizen-centric advisory service. We report on our evaluation in a within-subject user test with twelve front-office employees and 36 citizens. The details of the user test are described in the findings section.

***Discussion and Conclusion*** *(addressing III. And IV.):* We elaborate on the insights from the evaluation and reflect on the effects and impacts of the advisory information artifacts on transforming front office services and citizen-centric advising. We highlight the advisory information artifact's value for empowering front-office employees in practice. We further discuss the contribution of this study to advancing academic knowledge regarding the subject matter. We conclude by outlining the limitations of our research approach and presenting an outlook on future research.

## 5.4 Solution approach: Introducing advisory information artifacts

In a research collaboration with the local government of a major German city, the authors have developed and implemented the concept of an *advisory information artifact* to help their front offices changing from providing government-centric transaction-oriented processing service to offer citizen-centric advising. An *advisory information artifact* thereby provides front-office employees with comprehensive on-the-job support that empowers them to provide citizen-centric advisory services. With such an information artifact, employees in the resource-restricted work environment of front offices could

be provided with technical and methodical support to learn and apply the advisory-related skills necessary to provide true advisory services. For this purpose, an *advisory information artifact* is designed comprising three essential components: first, an integrated knowledge base, second, "counseling affordances" (cf. Giesbrecht et al., 2015a), and, third, "service encounter thinkLets" (cf. Giesbrecht and Schwabe, 2015).

### *5.4.1 Integrated knowledge base*

An advisory information artifact's first essential component is an integrated knowledge base. In previous modernization efforts, local governments extended their citizen service offers, focusing on communication channels like the Internet or the telephone to streamline government-citizen relationships. In doing so, they created comprehensive, integrated knowledge bases using ICTs to realize online self-services or to support call center agents to access information more efficiently (Kubicek and Hagen, 2000; Layne and Lee, 2001; Steinmetz, 2011; Torres et al., 2005). In numerous projects, these databases were developed and continuously maintained and refined, for example, in the context of the "Behördenrufnummer 115" in Germany or "NYC 311" and "Miami Call" in USA (cf. Steinmetz, 2011). An integrated knowledge base is essential to front-office employees so that they can access the broad subject matter expertise, which is needed when responding to the plethora of citizens' information and service requests. Therefore the advisory information artifact has to integrate the available comprehensive knowledge bases intelligently during the face-to-face service encounter with citizens.

### *5.4.2 Counseling affordances*

The second essential component of the advisory information artifact is to providing *counseling affordances*. In our research, we learned that employees – as non-professional advisors – require supplementary methodological support to apply the necessary advisory-related behaviors. *Affordances* describe the action choices provided by an artifact's characteristics to its

users, which emerge at the time of interaction (Gibson, 1977; Jones, 2003; Stoffregen, 2003), for example, when using a jug, a handle suggests to a user to lift it rather than pushing it. Hence, affordances suggest users to follow certain methods or to show certain behaviors. Moreover, users are generally able to perceive an artifact's affordance without additional cognitive effort (Fayard and Weeks, 2007; Zillien, 2008). In this manner, *counseling affordances*, are technical characteristics of an artifact, which suggests its users (i.e., front-office employees) to show certain advising behaviors. Different researchers showed that artifacts equipped with suitably designed affordances have large potential to function as instructional systems engaging learners in critical thinking and thus promote learning (Jonassen, 1999; Jonassen et al., 1998; Young, 2003). Thus, when integrating artifacts provide corresponding affordances in an employee's work environment, they have the potential to help starting experiential learning cycles (cf. Giesbrecht et al., 2014). In a previous publication (Giesbrecht et al., 2015a), we developed and assessed six key design concepts for equipping information artifacts with counseling affordances, which are concisely explained in the follow paragraphs:

First, an advisory information artifact should support *establishing a shared information space* (first key design concept) to afford front-office employees creating an open and participative work environment. In a shared information space, employees and citizens can form a collaborative setting between equal partner, both able to monitor, access, and edit necessary tools and information resources (cf. Figure 5.4-1).

**Figure 5.4-1: The established shared information space: advisor (right) and citizen (left) in front of the jointly viewed and operated advisory information artifact (on the table)**

Second, an advisory information artifact should be built on *connected problem-solving spaces that are linked with distinct process change bumps* (second key design concept) to afford front-office employees to establish a structured problem-solving process. In detail, a "problem elicitation" and "solution finding" space should be provided, each containing all tools and information resources necessary to perform the respective problem-solving activity (cf. exemplary instantiations in Figure 5.4-2). The distinct process change bumps to change between those spaces thereby can bring employees to switch more conscious and explicitly between the individual phases of the advisory process and therewith help them to structure their advisory encounters with citizens more actively.

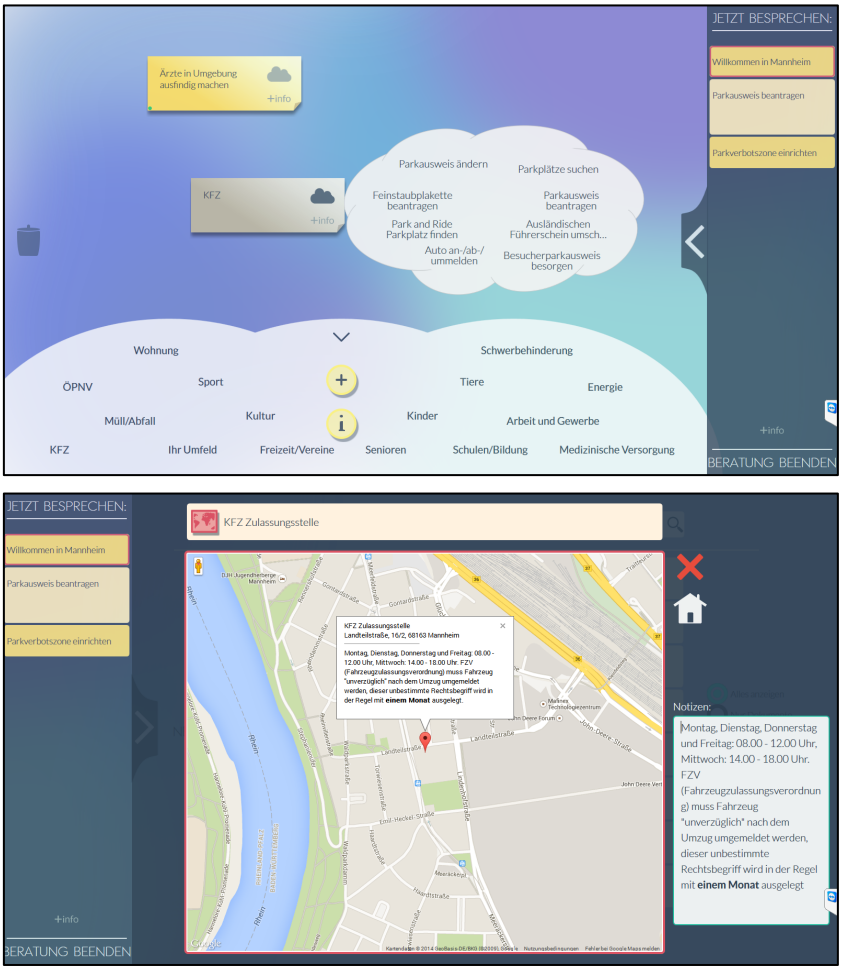


**Figure 5.4-2: The problem elicitation space (above) and the solution finding space (below) within an advisory information artifact (exemplary instantiations)**

Third, an advisory information artifact should *provide collaboration material and corresponding tools using well-known metaphors* (third key design concept) to afford front-office employees to intuitively use and integrate tools and information resources into the advisory collaboration. Therewith, employees

should be encouraged to make more intensive use of provided tools and information resources, while maintaining a close work relationship with the citizens. Figure 5.4-2 depicts a corresponding example where the drawing of a cloud on a blue empty background is provided to encourage users to start brainstorming while eliciting citizens' problems.

Fourth, an advisory information artifact should *enwrap existing tools and information resources* (fourth key design concept) to afford front-office employees applying traditional tools in co-creative work practices. Thereby, employees should be encouraged to show consistent co-creative advising behaviors preventing them from reverting to transaction-processing-oriented work behaviors when using existing tools and information resources. Figure 5.4-2 shows how location-related information like the address of the employment office is integrated in the visualization of advisor-client-interactions represented by a geographical map to encourage employees and citizens to jointly explore the information.

Fifth, an advisory information artifact should *provide contextualized memory aid* (fifth key design concept) to afford front-office employees to integrate external information resources smoothly and organically into an unfolding advising session. Contextual memory aids encompass not merely kernel information (for example, address of a pediatrician), but also closely related information (for example, opening hours, location information, or a web link) that help employees remember essential information, for example, "no service on Saturday or Sunday." Feeding contextualized memory aids has the capacity to encourage employees to integrate additional knowledge more easily into the advisory exchanges with citizens. As a consequence, employees can expand their own subject matter expertise and are concurrently supported to apply this expanded expertise to the service encounter. The white tag cloud feature in Figure 5.4-2 shows an exemplary instantiation of contextualized memory aid: When employees select a term in the large cloud (containing frequently asked topics of "new-in-town" citizens) a smaller cloud appears that contains the top eight related problem statements. For instance, choosing "children" subtopics like "find a school

for my child" points to location-related issues, or "find a pediatrician close by" linking to health-related issues. This additional context information can help employees find more related subject matters and provide them with a mechanism to integrate this additional knowledge seamlessly into the unfolding conversation.

Sixth, an advisory information artifact should *provide forward awareness,* that is, anticipatory information (sixth key design concept), which affords front-office employees to sustain an open, participative work environment while working with external information sources. Figure 5.4-3 depicts an example of anticipatory information. Whenever the problem statement of "new in town" citizen is entered, employees are provided with a colored dot (see lower left corner) providing information about the quality of the respective solution information (green=good, yellow=medium, red=poor). In general, having anticipatory information can enhance coordination and productivity of the actors involved in the advisory session (Cadiz et al., 2002; Dourish and Bellotti, 1992). As a consequence, the color red or orange can encourage employees to take action (in order to prevent providing citizens with poor information) and re-discuss the issue at hand, for example, by rephrasing the problem statement. Therewith, employees start guiding the problem-solving process more actively and also sustain a participatory work environment integrating the citizens in their actions, for example, by reworking the problem statement.

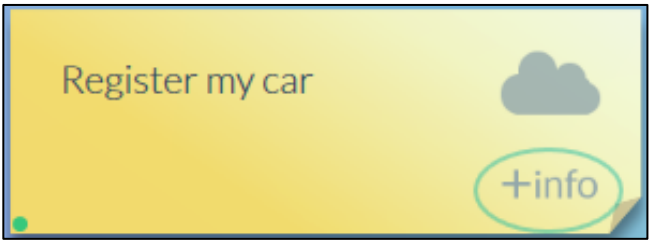


**Figure 5.4-3: Anticipatory information in form of a colored dot (see bottom left) informing users about the solution information quality to expect**

### *5.4.3 Service encounter thinkLets*

Alongside with the technical support from the counseling affordances, the design-and-evaluate cycles of the development process revealed that front-office employees need supplementary support to appropriately apply the advisory support artifact in social interactions and exchanges with advice-seeking citizens. Accordingly, the advisory information artifact provides as another key component social behavior guidelines that help front-office employees invoke fruitful IS-based collaborations, which best fit the respective problem-solving activity. Based on the concept of thinkLets (Briggs et al., 2003, 2001; De Vreede et al., 2006), the authors developed service encounter thinkLets that were used to provide practitioners with necessary collaboration-related knowledge. A s*ervice encounter thinkLet* (SET) provides social behavior guidelines that inform employees about best practices for collaborative problem-solving activities in advisory service encounters. Thereby, SETs allow front-office employees to acquire distinct moderation and facilitation skills, thus skipping time- and cost-intensive moderation or advisory trainings. Figure 5.4-4 depicts an exemplary SET for the problem-elicitation phase. A SET contains basic elements such as (i) an overview of the SET, for example, what goal can be achieved when a specific collaboration pattern is invoked; (ii) it further details how the collaboration pattern can be activated in form of a script giving instructions regarding usage of available tools; and (iii) it also makes available decision guidelines that help decide which SET to use in what phase of the advisory process (cf. Giesbrecht and Schwabe, 2015) for elaborate details on SETs). The use of SETs can diminish deficiencies found in other qualification methods for service personnel. In contrast to the application of scripts in service personnel's training (for example, Holman, 2002; Leigh, 1987), SETs provide front-office employees with a repertory of co-creative work practices rather then pre-structuring the advisory dialog and purporting a rigid advisory process. The "decision guidance"-element in each SET enables the advisors to decide for themselves when to apply a certain SET in a given problem-solving activity. SETs also let the advisor alter the session and the advisory

process at any time. Therewith the potentially negative effects of standard communication scripts on the provision of personalized service can be overcome and even prevented.

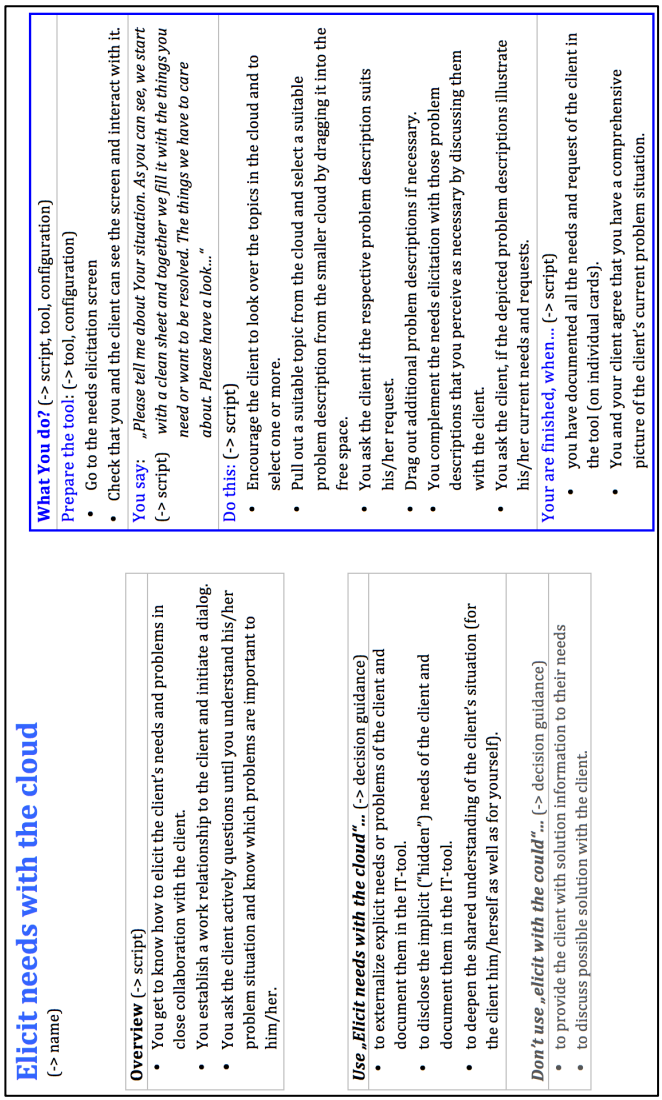


**Figure 5.4-4: Exemplary service encounter thinkLet for the problem elicitation phase (Giesbrecht and Schwabe, 2015)**

**In summary**, by equipping employees' workspace with counseling affordances and providing social behavior guidelines in form of service encounter thinkLets, advisory information artifacts can be created that copes with the resource-restricted work environment of government front offices and have a large potential of empowering front-office employees and raising their skill sets on-the-job. Advisory information artifact can enable employees to start experiential learning on-the-job to acquire new skills and eventually change from their role as administrators to become skilled advisors. Advisory information artifacts supply effective support for less-trained service personnel with little (if any) advisory-related qualification, like front-office employees. Deploying advisory information artifacts in government front offices might be instrumental in overcoming deficiencies of previously applied learning-from-others qualification approaches, which have frequently resulted in a wide variety of training outcomes. As proof-of-concept studies have shown (for example Giesbrecht et al., 2014), advisory information artifacts can effectively complement training or qualification measures such as shadowing or mentoring with methodic on-the-job support. That way they help establish more predictable and consistent qualification of front-office employees when it comes to participatory and problem-oriented service provision.

## 5.5 Findings

For assessing and evaluating the efficacy and impact of an advisory information artifact in practice, we implemented an instantiation in the context of a local government front office in a major German city. By means of a within-subject user test, we assessed whether or not, and if so, how deploying advisory information artifacts in a front office actually affected advisory service provision in general, the work practices in particular, and also the service quality. Before describing the assessment procedure, the evaluation design, the data collection, and the results, we first provide a case description and the instantiation of the advisory information artifact in that particular context.

### *5.5.1 Case description*

For a government front office of a major German city, the authors developed an advisory information artifact supposed to support front-office employees in providing high-level and citizen-centric advisory services to "new-in-town" citizens. This group of citizens typically lacks knowledge regarding services and government-related requirements including the procedures and processes when moving into a new urban environment, such as "how to register myself," or "how to enroll my child in a public school", or "how to dispose different types of waste." Accordingly, front-office employees need to give comprehensive and individually-tailored advice rather then merely processing transactions such as registering the person in the local public registry as is required in Europe and other regions. Initially, the local government did not provide any other service beyond the mere act of registration. However, employees were summoned to provide additional information as necessary and requested while processing the registration.

The instantiation of the advisory information artifact and its essential individual components comprised (i) an integrated knowledge base that was provided by the local government supplemented by the authors, (ii) the counseling affordances, technically implemented in a 20-inch All-In-One tablet computer with a touch-screen (cf. Figure 5.4-1), and (iii) service encounter thinkLets provided on paper (one SET per sheet; cf. Figure 5.4-4).

### *5.5.2 Assessment and evaluation design*

We assessed and evaluated the effects of introducing the developed advisory information artifact in front offices in a user test in a within-subject test design, where 12 front-office employees (from hereon referred to as advisors) gave advice to 36 citizens in 84 advisory sessions. The twelve advisors where selected by the management of the local government among the staff of their front offices. For the participating citizens, we recruited students from a neighboring city (about 120 km away). That way prior knowledge regarding city-specific administrative issues and processes was

limited, that is, the subjects would act just like new residents. Furthermore, this also mimicked the city government's needs since students represented one of the largest groups of new residents. Of the 12 advisors in the test 9 were female, and 3 were male. The advisors were between 19 and 57 years old (mean value 31.3 years) while 22 of 36 sample citizens were female, and 14 were male. The citizens' age ranged between 18 and 56 years (mean value 27 years). In the evaluation we compared the advisors' conventional and artifact-supported advisory sessions, and collected measurable and observational data about the differences. In the conventional advisory sessions, the advisors gave advice as they would normally do in their daily work. In the artifact-supported advisory sessions, the advisors made use of the advisory information artifact. As within-subject test design, each participant (advisor or citizen) experienced at least one conventional advisory session and one artifact-supported advisory session, to report directly on the perceived differences. The test was designed as follows:

First, the advisor received a refresh on the basic objectives of citizen advisory services to ensure an equal state of knowledge among the advisors had been established. Second, the advisors conducted a conventional advisory session in their normal workplace. Third, in a training episode of five hours, the advisors received technical instructions on how to handle the IT-tool comprising the counseling affordances. They also were asked to read the service encounter thinkLets for the individual problem-solving activities and to try them out in a role-play. Fourth, the advisors conducted three artifact-supported as well as three conventional advisory sessions in alternating order. The citizens were assigned to ensure that each of them experienced at least one conventional and one artifact-supported advisory session in order to report on the differences. Following the action design research approach, we were able to establish external validity from evaluating in the real organizational context.

In reporting on the evaluation and its results, we refer to "artifact-supported advisory sessions" when sessions were supported by the advisory information artifact. The other sessions are referred to as "conventional

advisory sessions." As before, we refer to employees participating in the evaluation as advisors.

### *5.5.3 Data collection*

Data were collected for the comparison between conventional and artifact-supported advisory sessions by using interviews, questionnaires, and video recordings, gathering quantitative and qualitative data on behaviors and perceptions of individuals involved.

First, all advisory sessions were recorded on video. These recordings were coded and analyzed by two researchers to identify and assess the advisors' work behaviors regarding their advising behaviors. In particular it was assessed how the advisors

(i) guided the citizens through a structured problem-solving process (collecting the number of employees' respective actions such as proposing topics and asking questions to steer the discussion, explaining the advisory process, or applying auxiliary means to support comprehensibility of the advisory process),

(ii) applied available tools and information resources actively and co-creatively within the individual problem-solving activities (identifying statements of invitation for participation and material-supported explanations from advisors), and

(iii) established and maintained a close relationship with citizens during service encounters (measuring percentage of conversation time compared to session time, identifying relationship-building actions by advisors, for example, by asking follow-up questions and active listening showing empathy, or applying auxiliary means to promote equal access to information).

Second, we conducted semi-structured interviews with all participating advisors and citizens to learn about the underlying reasons and motivations for their behaviors during the advisory sessions. Therefore, the interview guidelines consisted of questions about the satisfaction with the advisory service, about citizens' perceptions regarding how the advisors established co-creative interactions with them (the DART model after (Prahalad and Ramaswamy, 2004a), and about the perception of involvement in the value creation process. These interviews lasted 35 minutes on average.

Third, advisors and citizens provided quantitative feedback by filling out a questionnaire. Foremost, the questionnaire comprised items for assessing the advisors' comprehensive empowerment. We therefore used the measuring tool from Spreitzer (1995) for psychological empowerment in the workplace and adapted it to the front-office workplace. We then measured the constructs of *competence* (for example "I have mastered the skills necessary for giving advice."), *self-determination* (for example "I have significant autonomy in determining how I structure my advisory sessions"), *meaning* (for example "The work I do is meaningful to me"), and *impact* (for example "In my advisory sessions, I have significant influence on the citizens"). Furthermore, we used the KODEX[10] measuring tool (Heyse and Erpenbeck, 2007), which was created to assess, measure and diagnose employees' work-related skills, including their professional, methodical, social/communicative, personal and activity/action-oriented skills, for assessing additional individual front-office skills of that these employees need to have in their roles as advisors. These skills comprise employees' dialog/communication skills, their media competence (knowledge and methodical skills to utilize and integrate available information sources), and their systematic-methodical skills to guide clients through a structured advisory process. Since the KODEX instrument is fairly comprehensive, we here focus on the measurements of aforementioned skills. Finally, additional items addressed the participants' perceived service quality (Yield Shift Theory; (Briggs et al., 2012), for example, "I am satisfied with the received advisory session"), their perceived relatedness (included in the IMI measuring instrument (intrinsic motivation inventory; (Deci and Ryan, 2003; McAuley et al., 1989; Ryan et al., 1983; Ryan, 1982)), for example, "I felt close to the advisor", and their perceived involvement in the value creation process ("I felt myself involved in the creation of the result in the following

[10] Originally, Prahalad and Hamel (1990) developed the concept of core competencies in organizations in the field of management. In the German-speaking world, the work by Erpenbeck and von Rosenstiel (2007) has been most often used to research corresponding core competencies and their components. Thereby, Heyse and Erpenbeck (2007) translated their concept into the KODEX instrument to assess, measure, and diagnose personal competencies.

advisory sessions"). All items in the questionnaire were rated on a 7-point Likert scale with 7 as high score and positive maximum.

### *5.5.4 General Results: Empowering front-office employees*

Comparing conventional and artifact-supported advisory sessions in our evaluation revealed that both citizens as well as advisors were significantly more satisfied with the new, artifact-supported advisory service. Citizens rated their satisfaction levels on average at 6.2 in the artifact-supported sessions, but only 5.5 in the conventional sessions (significant difference, two-sided t-test, $T(35)=2.854$, $p=0.007$). The advisors rated their satisfaction 5.5 in the artifact-supported sessions, but only 4.4 in the conventional sessions (significant difference, two-sided t-test, $T(11)=2.564$, $p=0.026$). Furthermore, the evaluation revealed that the advisory information artifact could substantially help empower front-office employees in developing their advisory-related skills. The participating advisors themselves as well as the advice-seeking citizens rated the individual aspects of empowerment, that is, competence, self-determination, meaning, and impact (Spreitzer, 1995), significantly higher in the artifact-supported advisory sessions than in the conventional ones. While Figure 5.5-1 depicts the summarized ratings, we report on the detailed results on each empowerment aspect in the following paragraphs.

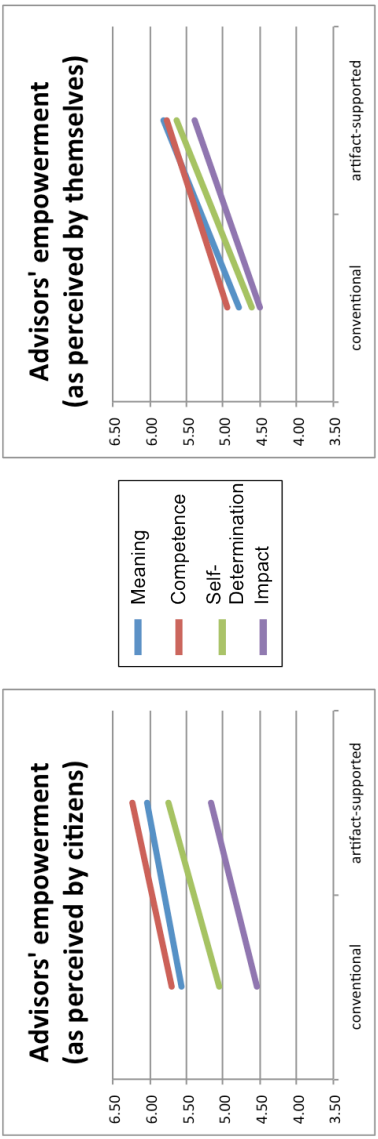


**Figure 5.5-1: The effects of introducing an advisory information artifact in front office service on employees' empowerment**

First, the participating citizens assessed the employees' work-related competence significantly higher in the artifact-supported advisory sessions than in the conventional ones (6.2 in the artifact-supported sessions, 5.7 in the conventional sessions; significant difference, two-sided t-test, $T(35)=2.034$, $p=0.05$). The citizens emphasized that in the artifact-supported sessions the advisors "could answer all their questions", "knew how to apply tools and information resources," or, "could always find some solution information." But also the advisors perceived themselves as being significantly more competent to give advice to citizens when being supported by an advisory information artifact (5.8 in the artifact-supported sessions, 4.9 in the conventional sessions (significant difference, two-sided t-test, $T(11)=2.224$, $p=0.048$)). The advisors emphasized that the advisory information artifact supported them in finding and providing helpful solution information to all the citizens' issues, and therewith supported enhancing their subject matter expertise.

Second, the citizens perceived the advisors in the artifact-supported sessions as substantially better capable of customizing the advisory process to their individual needs than following a standard procedure (5.8 in the artifact-supported sessions, 5.1 in the conventional sessions; significant difference, two-sided t-test, $T(35)=2.833$, $p=0.008$). Furthermore, the citizens described that they could "understand the solution better […] how they match their needs" and that "it was more personalized". The advisors' feedback confirmed these perceptions and perceived themselves as being considerably better able to adapt the advisory process in the artifact-supported sessions (5.6 in the artifact-supported sessions, 4.6 in the conventional sessions (significant difference, two-sided t-test, $T(11)=2.846$, $p=0.016$). Thereby, they referred to the artifact's explicit support. One advisor, for instance, emphasized: "With the information from the little lights [the anticipatory information], I could guide the solution discussion much better."

Third, the citizens perceived that in the artifact-supported advisory sessions advisors had considerably more influence regarding how they would shape their changing life situation as "new-in-town" citizens (5.2 in artifact-

supported sessions, 4.5 in conventional sessions; significant difference, two-sided t-test, T(35)=2.262, p=0.03). One citizen, for instance, stated, "The advisor in the first session [the artifact-supported advisory session] had more influence on me […] on my next activities." The advisors confirmed citizens' perceptions by rating the impact of their own work in the artifact-supported sessions as significantly higher (5.4 in artifact-supported sessions, but only 4.5 in conventional sessions; significant difference, two-sided t-test, T(11)=2.267, p=0.045). One advisor mentioned, " I believe that in my artifact-supported sessions, I could reach the citizens better." And another advisor stated, "I think that the citizens in artifact-supported sessions are more likely to implement the ToDo's that we discussed."

And fourth, in addition to the advisors' increased work-related skills (as perceived by citizens and advisors alike), the participating citizens assessed the advisors in the artifact-supported advisory sessions as having considerably higher "meaning," that is, understanding and meaningfulness of their work (6.0 in the artifact-supported sessions, 5.6 in the conventional sessions; significant difference, two-sided t-test, T(35)=2.162, p=0.037). The advisors did also assigned a significantly higher "meaning" to the advisors' work in artifact-supported advisory sessions compared to traditional sessions (5.8 in the artifact-supported sessions, but only 4.8 in the conventional sessions; significant difference, two-sided t-test, T(11)=2.634, p=0.023).

### *5.5.5 Transforming effects of applying advisory information artifacts*

While this evaluation revealed that introducing an advisory information artifact has the potential to substantially empower front-office employees and improve advisory service provision, the data, especially participants' qualitative feedback and the observations indicate that the advisory information artifact also helped initiate more profound changes in citizen advisory services.

With introducing an advisory information artifact, the physical environment of the face-to-face service encounter changed substantially, influencing both

participants in their behaviors. From siting on opposite sides of a desk in the conventional sessions, employees and citizens now positioned themselves side-by-side in front of the advisory information artifact (Figure 5.4-1 depicts the physical setup in artifact-supported advisory sessions). In changing the environment, citizens and employees began to change their perceptions of the service encounter, which they expressed in their statements. Participating citizens preferred the artifact-supported sessions and emphasized the "closer collaboration" and "more direct communication" with the advisors. Nine of twelve citizens made similar statements regarding artifact-supported sessions appreciating to "follow the advisors actions and comprehend how the solutions was found." One citizen stated, "[in the artifact-supported session] I understood the solutions better […] how they match my needs." In contrast, when referring to the conventional advisory sessions, citizens found these "not so well structured," or the solutions were "harder to comprehend" In this context, citizens perceived themselves as significantly better involved in the problem-solving process (5.1 in the artifact-supported sessions, 4.2 in the conventional sessions; significant difference, two-sided t-test, $T(35)=2.394$, $p=0.022$). Furthermore, citizens clearly indicated that they comprehended the results substantially better in artifact-supported sessions (5.5 in artifact-supported sessions, 4.6 in conventional sessions; significant difference, two-sided t-test, $T(35)=3.171$, $p=0.003$). In this context, conversation time between advisors and citizens increased substantially in artifact-supported advisory sessions compared to conventional sessions (71% of the total advisory session's time they talked with each other in the artifact-supported sessions, in contrast to only 54% in the conventional sessions).

In a changed workplace environment, advisors also began changing their basic attitude toward front-office work; from "I don't want the client to participate and to be too close to me" as typical for conventional sessions, advisors' statements changed to "especially like the collaboration with the citizen," or even, "it is fun to work with the citizens that closely." One employee summarized the benefit of artifact-supported sessions: "We

[advisor and citizen] could establish a shared understanding of the citizen's problems much quicker." In this context, the advisors perceived that they could involve the advice-seeking citizens significantly better in the problem-solving process in artifact-supported sessions (5.4 in the artifact-supported sessions, 4.4 in the conventional sessions; two-sided t-test, $T(11)=3.317$, $p=0.007$).

Our observations also revealed that the service encounter between advisors and citizens changed substantially between conventional and artifact-supported advisory sessions. While in conventional sessions a question-answer-pattern with predominantly one-way communication prevailed, in artifact-supported sessions a recognizable problem-solving process unfolded including extensive information exchanges. In this context, both advisors and citizens perceived the advisors to be significantly better able to control and steer the advisory process in artifact-supported advisory sessions than in the conventional sessions (significant difference; cf. advisors' and citizens' self-determination ratings in 5.4). Furthermore, citizens also expressed their appreciation of the changed advisory process. A third of the participating 36 citizens made statements to the extent that as opposed to conventional advisory sessions the new advisory process allowed them "to learn new things" or "be given useful information that they would not have expected." The advisors appreciated that the problem-solving process was made more visible to the citizens and therewith "showed their work to the citizens." One advisor stated, "The citizens could see all the work I am doing […] therewith, they appreciated my work more." The advisors' appreciation of the changed service encounter was also reflected in their ratings of the substantially higher meaning of their advisory work and the higher impact on citizens in the artifact-supported advisory sessions (cf. values in 5.4). Finally, ten of the twelve advisors made statements to the extent that in the artifact-supported advisory sessions with its changed advice-delivery process, citizens were "more active", would "understand faster," and ultimately could "work more efficiently."

When analysis the observations, we found that advisors had substantially changed their role and respective behaviors upon switching from conventional to artifact-supported advisory sessions. From awaiting citizens' requests in the conventional advisory sessions, in the artifact-supported sessions advisors changed to initiating a lively discussion with mutual knowledge exchange while actively guiding the conversation. These observations were also supported by citizens' feedback who rated the advisors' communication and dialog-related skills substantially higher in artifact-supported sessions (6.2 in the artifact-supported advisory sessions, 5.7 in the conventional ones; significant difference, two-sided t-test, $T(35)=2.14$, $p=0.04$). Furthermore, citizens believed that advisors made more appropriate use of available tools and information resources than in conventional advisory sessions, for example, to support communication (6.1 in the artifact-supported advisory sessions, but only 5.3 in the conventional sessions; significant difference, two-sided t-test, $T(35)=3.329$, $p=0.002$). The advisors appreciated the support from the advisory information artifact and referred to various features that supported the structuring of the advisory process and the integration of available tools and information resources. Eight of twelve participating advisors, for instance, explicitly referred to the tag cloud feature helping them uncover the citizens' needs more efficiently. Or, four of the twelve advisors named anticipatory information provision the most helpful feature supporting active guidance throughout the exchanges.

Finally, the role of citizens also substantially changed between conventional and artifact-supported advisory sessions. In conventional advisory sessions, citizens waited for the advisor to provide answers to previously asked questions. In contrast, in artifact-supported sessions, citizens used the side-by-side seating position with the advisor, enabling them to monitor and access information, to start participating in creating the advisory session's results. Advisors' repeated invitations to participate in the process supported the citizens in assuming the role of active co-creators (on average, four invitations to participate in artifact-supported sessions, but no

invitation in conventional sessions). Indicating her appreciation of the close collaboration with the advisor, one citizen summarized, "I clearly prefer the supported advisory session. I liked to be able to participate more […] the advisors integrated me actively in all steps."

## 5.6 Discussion

The evaluation provide initial evidence that *advisory information artifacts* have the capacity of empowering public employees in the resource-confined work environment of front offices to provide true advisory services (addressing RQ2). With relatively minimal training when the advisory information artifact is introduced, front office employees could almost immediately improve their advisory-related skills on-the-job and transform to advisors and advisors. Designing advisory information artifacts and making them integral parts of employees' work environment turned out as viable complement to existing learning-from-others qualification measures. They enabled both newly assigned and long-term front-office employees to acquire skill sets deemed necessary for working in modern public administrations. This result directly addresses Lenk's (2002), Schenk and Schwabe's (2011), or Schuppan's (2010) pleas for specifically deepening academic knowledge on how qualification-related deficiencies in public service provision could be effectively diminished.

As the results demonstrate, the advisory information artifact not only supports front-office employees in improving diverse professional, methodical, and personal skills (cf. Giesbrecht et al., 2015a; Giesbrecht and Schwabe, 2015), but it also helps employees reach a state of actual empowerment (Spreitzer, 1995) in their novel role as advisors. Citizens perceived advisors as significantly more competent and more trustworthy when giving comprehensive advice, also resulting in improved service satisfaction. The substantial improvement of employees' perception of meaning and impact of their work may also contribute to strengthening the intrinsic work motivation and therewith addresses the public service motivation, which is a most influential factor regarding public employees'

work performance as Wright (2007) or Anderfuhren-Biget et al. (2010) pointed out. In the course of their empowerment, public employees furthermore began valuing front-office work more highly, changing their traditionally low assessment of front-office work compared to back office activities (Weerakkody et al., 2011).

In local government front offices, service practices need to transform to meet the increased service-quality expectations of citizens (Accenture, 2005; Schedler and Proeller, 2000) and to implement citizen-centric advisory services (cf. King and Cotterill, 2007; United Nations and Department of Economic and Social Affairs, 2014; Weerakkody et al., 2011). Our study clearly shows that deploying an advisory information artifact has the capacity to promote substantial changes in front office service provision offering more citizen-centric and co-creative advisory services than mere transaction-oriented processing. It thereby helps initiating the fundamental transformation of the service paradigm.

In the following paragraphs, we discuss how an advisory information artifact can support such transformational changes in service provision using the drama metaphor (Grove and Fisk, 1992; Zomerdijk and Voss, 2010) often used "to understand, describe and communicate about services" (Zomerdijk and Voss, 2010, p. 68). Therein, the basic service delivery process, the service provider (i.e., front-office employees), the clients (i.e., citizens), back office support (i.e., tools and information resources), and the physical environment are described as the main components of a service.

***The service delivery process: From government-centric to citizen-centric service***

Providing front-office employees with counseling affordances and service encounter thinkLets caused the service delivery process to change substantially (addressing RQ1). Traditionally, public employees treated citizens as petitioners and focused on processing pre-defined transactions. Thereby, they used selected information resources that were provided according to governmental needs. The left side of Figure 5.6-1 illustrates the

traditional service encounter with its underlying paradigm. Yet, with the advisory information artifact, front-office employees started to provide co-creative advisory services where citizens felt being treated as actual clients. In so doing, integrated information resources were used that aligned to citizens' needs. The right side of Figure 5.6-1 illustrates the novel, artifact-supported service encounter. The concept of affordances turned out to be most suitable to effectively provide methodical guidance, encouraging employees to try out novel work practices on-the-job. This way, employees could see the positive effects of the service paradigm change themselves and reflect on its benefits, which eventually led to adopting the novel advisory practices. Furthermore, it was the predictability of the SET-invoked patterns of collaboration and the integrated information base that provided employees with the security they needed to act confidently and competently in their transition from administrator to advisor. Therewith, we could show how *advisory information artifacts* could be designed and applied to effectively support initiating transformational change in local governments' service provision strategies toward citizen-centric service delivery as Weerakkody et al. (2011, 2008), King and Cotterill (2007), Davison et al. (2005) or Irani et al. (2007) had demanded.

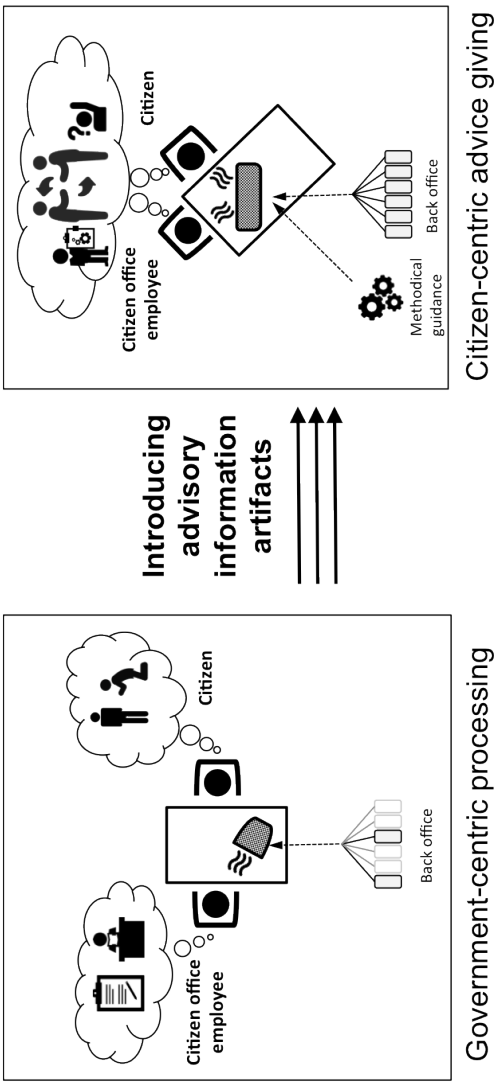


**Figure 5.6-1: Transformational changes from introducing an advisory information artifact: From government-centric processing to citizen-centric advice giving**

***The physical environment: Enabling co-creative advisory services***

With introducing an advisory information artifact, specifically the counseling affordances, the physical environment of the service encounter substantially changed. The physically-established shared information space facilitated the building of a close work relationship between the actors, as Heinrich et al. (2014) described. Furthermore, it supported the reduction or even elimination of communication and information barriers as Rodden et al. (2003) called for. As a consequence, after deploying an advisory information artifact, the changed physical environment affords its users, that is, front-office employees and citizens, to act as co-creators with the same rights (to access and edit information) and duties (to participate and contribute actively to reach the advisory session's objective). This highlights the importance of the physical environment to enable co-creative service encounter as a precondition for establishing citizen-centric services as called for by Weerakkoddy et al. (2008) or King and Cotterill (2007).

***Front-office employees: From bureaucratic administrators to skilled advisors***

With the help of counseling affordances, front-office employees were enticed to try out novel advisory practices and thereby start learning and applying skills they needed to resolve an advice-seeking citizen's diverse and complex information needs. Therewith public employees gradually morphed from back-office bureaucrats into advisors extending their work practices from previous transaction-oriented administrative processing to co-creative advising. They started to moderate the problem-solving process and helped citizens with their diverse information needs to successfully cope with the myriads of governmental information sources and services. With deploying an *advisory information artifact*, we showed how the back-office specialists could be transformed into generalists who acquired the necessary methodical skills and subject-matter knowledge to handle a plethora of citizens' information and service requests. In this regard, we continued the research of Lenk (2002), Schenk and Schwabe (2011) or Lenk and Klee-Kruse (2000) and specified how front-office employees could effectively be empowered to work in modern public administrations, providing citizen-

centric services. Accordingly, we are convinced that introducing an advisory information artifact to government front offices can help promote organizational transformation toward more citizen-centric structures and work practices especially with regard to the previously neglected level of the individual front-office employee.

Using ICTs to "make offers" (following the concept of affordances) and making them an integral part of the front-office employee's work environment turned out to be suitable means to promote employees' on-the-job learning and appropriation of their changing role in the service encounter. More specifically, the combination of counseling affordances and SETs functions as a scaffolding framework for front-office employees.

***Citizens: From petitioners to active co-creators***

With deploying tailored advisory information artifacts, the service settings change in the way that citizens perceive themselves as clients rather than petitioners and become active co-creators of the service and its outcomes. Citizen's perception of government services might reflect an increase in service quality in the course of taking more responsibility for the advisory service's product and value (Prahalad and Ramaswamy, 2004b; Susanne Schmidt-Rauch and Nussbaumer, 2011). Under these conditions, the service encounter can become an entirely positive experience for the citizens (Prahalad and Ramaswamy, 2004a).

***Back office support: From simple information provision to offering methodical guidance and integrated information resources***

In conventional service settings, information resources merely provide select information necessary for processing pre-defined transactions, for example, car registration or passport extension (cf. Figure 5.6-1 on the left). Furthermore, they rarely provide any additional support such as how to apply available information resources methodically within the service encounter. Using advisory information artifacts can completely change the service encounter: First, they can provide integrated information resources bringing together distributed information and services from silo-structured

back offices. Second, thanks to the counseling affordances, they can provide methodical guidance on how to integrate information resources appropriately into service encounters with citizens to create co-creative interactions. Therewith, they help front-office employees establish the broad subject matter expertise needed in front office service provision.

***The Ongoing Change and the Interplay of Delivery Modes in Government Service Provision***

The evolution of ICT-based service delivery mechanisms has helped governments provide an increasing number of informational and transactional services online. These not only provide convenient and high-quality services to businesses and citizens at locations of their own choosing, but also reduce the service load in front offices while also lowering service provision costs. However, it is worthwhile to distinguish that the predominant type of services that can be provided online still pertains to the simpler and more structured informational and transactional services. Paying a tax bill online or looking up the details of licensing requirements are cases in point. However, once it comes to more complex, semi-structured, or unstructured service requests, the front office has remained the most frequented venue of service delivery. We found that utilizing advisory information artifacts for service provision in front offices, the quality of service can measurably improve, also leading to the perception of improved service quality on part of businesses and citizens. Advisory information artifacts not only ready government employees for providing competent services outside and beyond their own immediate area of expertise. But this way, front-office service provision has also the capacity to match online services in high-quality outcomes and superior service experiences potentially also at a lower cost. Positive side effects may include that front-office work becomes more attractive to employees, and employees might feel empowered and more highly valued internally and externally. Finally, the new front-office service provision model complements the successful online service model, albeit for the more complex and less

structured service requests (see Figure 5.6-2) lifting overall government service provision to higher levels of quality and immediacy.

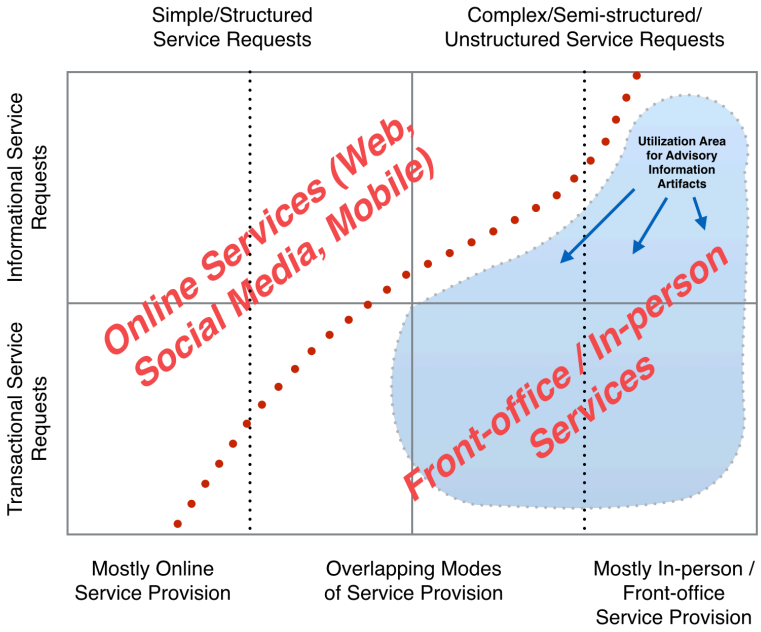


**Figure 5.6-2: Advisory information artifacts in the front office help match front office service quality and service outcome expectations to those of online services lifting overall service quality**

## 5.7 Conclusion

In this paper, we address a gap in current research on transforming government, the face-to-face citizen service encounter. We identified the qualification of front-office employees as a missing factor for achieving value co-creation, which represents an essential part for providing more citizen-centric services. Researchers and practitioners striving to transform government in general and its front offices in particular are the primary target group of our research. With introducing a suitably designed *advisory*

*information artifact*, they can effectively promote transforming front offices in order to offer citizen-centric, co-creative advisory services as Weerakkody et al. (2011, 2008), Davison et al. (2005) or Irani et al. (2007) called for.

We hold that two other research streams may also benefit from our results. First, researchers from collaboration engineering can see how their research can be extended to the setting of dyads. Traditionally, collaboration engineering has targeted larger groups (>5 people) and has not considered asymmetric relationships that characterize advisory service encounters. Second, e-learning researchers might benefit from better understanding of how affordances can be used to advance learning in the workplace. Specifically, the role of ICT in effectively guiding learners to improve their work-related skills might be of great interest leading to adapting the concept of counseling affordances to improve e-learning system design.

Local governments' managements can benefit from this study's insights and use the concept of an *advisory information artifact* to promote service modernization and transformation efforts by complementing these with suitable front-office measures. Designers and developers of information systems used in front offices can adopt the concepts of counseling affordances and service encounter thinkLets to improve system design making them an integral part of managers' modernization efforts.

Our study showed that initiating (transformational) change in front offices by introducing *advisory information artifacts* also points to certain preconditions to work effectively. First, public employees need the ability to perceive the affordances, i.e., the action possibilities, that are provided to them as perceiving affordances need to be learned (Guski, 1996). Second, for the advisory information artifact to be most effective, public employees need to have to develop a basic service motivation. This includes the willingness to put citizens in the center of their work and the urge and openness to learn new work practices allowing them to leave the traditional role as administrators and become advisors. Persisting problems that can counteract implementing these preconditions include that public employees still often perceive front-office activities as lower in ranking than back-office activities

(Weerakkody et al., 2011). Or, also, an employees' transfer into a front office position frequently occurs when they are deemed not fit for back office jobs (Lenk and Klee-Kruse, 2000; Schenk and Schwabe, 2011). In future research, the initial insights on front-office employees' job requirements need be expanded. Studying job profiles for public service personnel would help deepen the understanding of citizen-centric service provision and, especially, its most important enablers, that is, the front-office employees.

The concept of an advisory information artifact builds on the general concept of affordances (Gibson, 1977; Stoffregen, 2003) and of thinkLets (Briggs et al., 2003, 2001), and is fitted to a generic problem-solving process (Simon et al., 1987). Hence, our findings might be transferrable either to other front-office service encounters in different agencies and governmental departments, for example, social welfare, or, also private service domains, for example, advisory services in travel agencies or financial advisory services. However, operational design and instantiation should be adapted to the respective domain in a design-and-evaluate process for providing the best fit of the advisory information artifact.

Like all other research so has this study its limitations. Working with actual front-office employees in real-world work environments gave us deep insights but also restricted our possibilities for evaluation. The introduction of the advisory information artifact could be evaluated in a test over six days. Hence, we could not draw conclusion on the actual organizational integration and the long-term appropriation of the advisory information artifact. For addressing this limitation, we currently run a longer-period test in other front offices of the same major German city. By this undertaking we are collecting additional data, which will likely deepen our organizational insights on the efficacy of advisory information artifacts in front-office work environments and their sustainable effects on front office service provision.

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